



List of titles in Series 737

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man in the air
man and his car
lions and tigers
man on the sea
dinosaurs
castles
baby animals
roads
song birds
trains
bridges
homes
leaves
soldiers
sounds
big animals
under the ground

apes and monkeys
living things
the tree and its world
air
seals and whales
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under the ground

LADYBIRD LEADERS



under the ground





to teachers and parents

This is a LADYBIRD
LEADER book, one of a
series specially produced
to meet the very real need
for carefully planned
first information books
that instantly attract
enquiring minds and
stimulate reluctant readers.

The subject matter and
vocabulary have been selected
with expert assistance, and the
brief and simple text is printed
in large, clear type.

Children's questions are
anticipated and facts presented
in a logical sequence. Where
possible, the books show
what happened in the past
and what is relevant today.

Special artwork has been
commissioned to set a standard
rarely seen in books for this
reading age and at this price.

Full-colour illustrations are on
all 48 pages to give maximum
impact and provide the
extra enrichment that is the
aim of all Ladybird Leaders.

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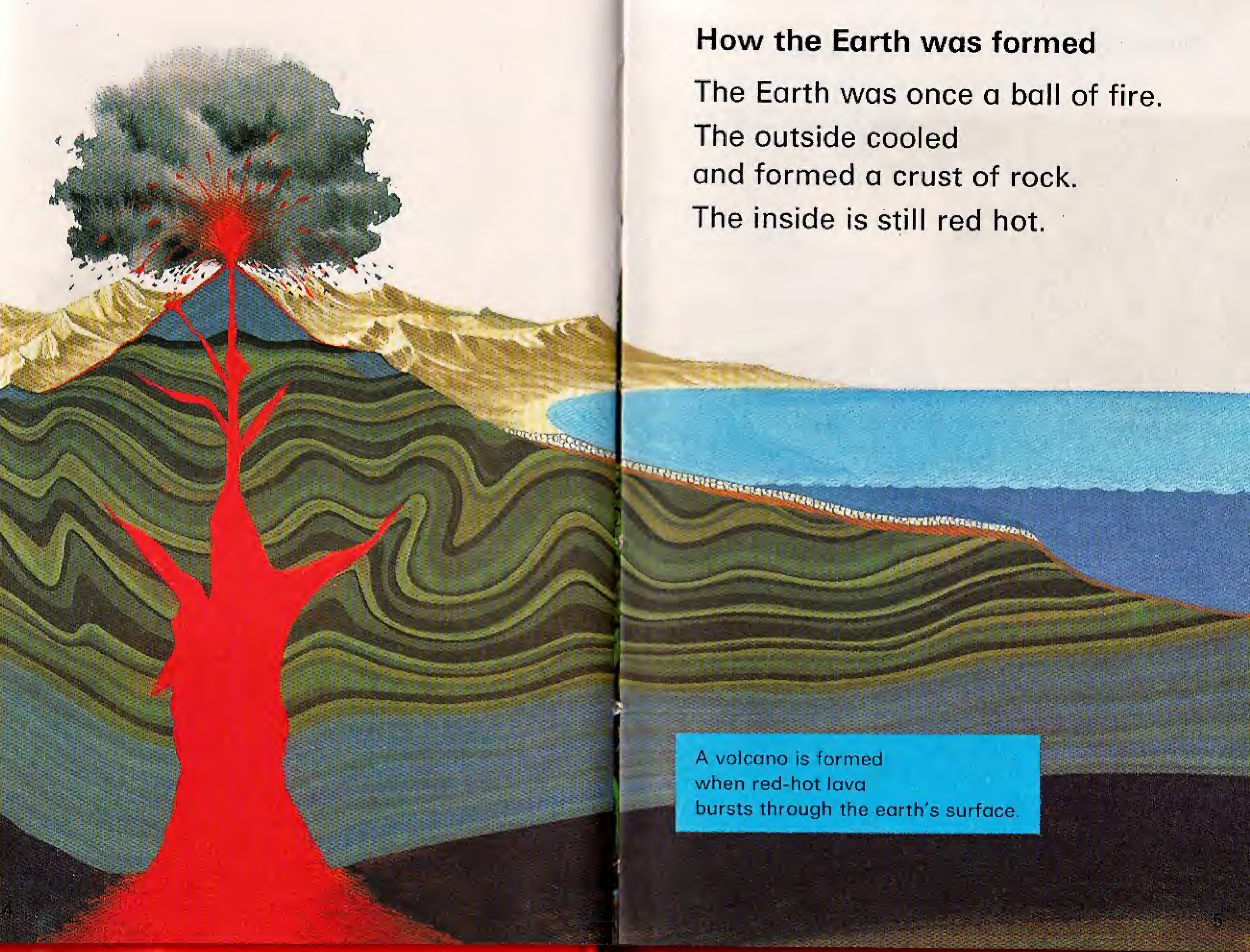
A Ladybird Leader

under the ground

written by James Webster

illustrated by Gerald Witcomb, Frank Humphris
and David Palmer

Ladybird Books Loughborough

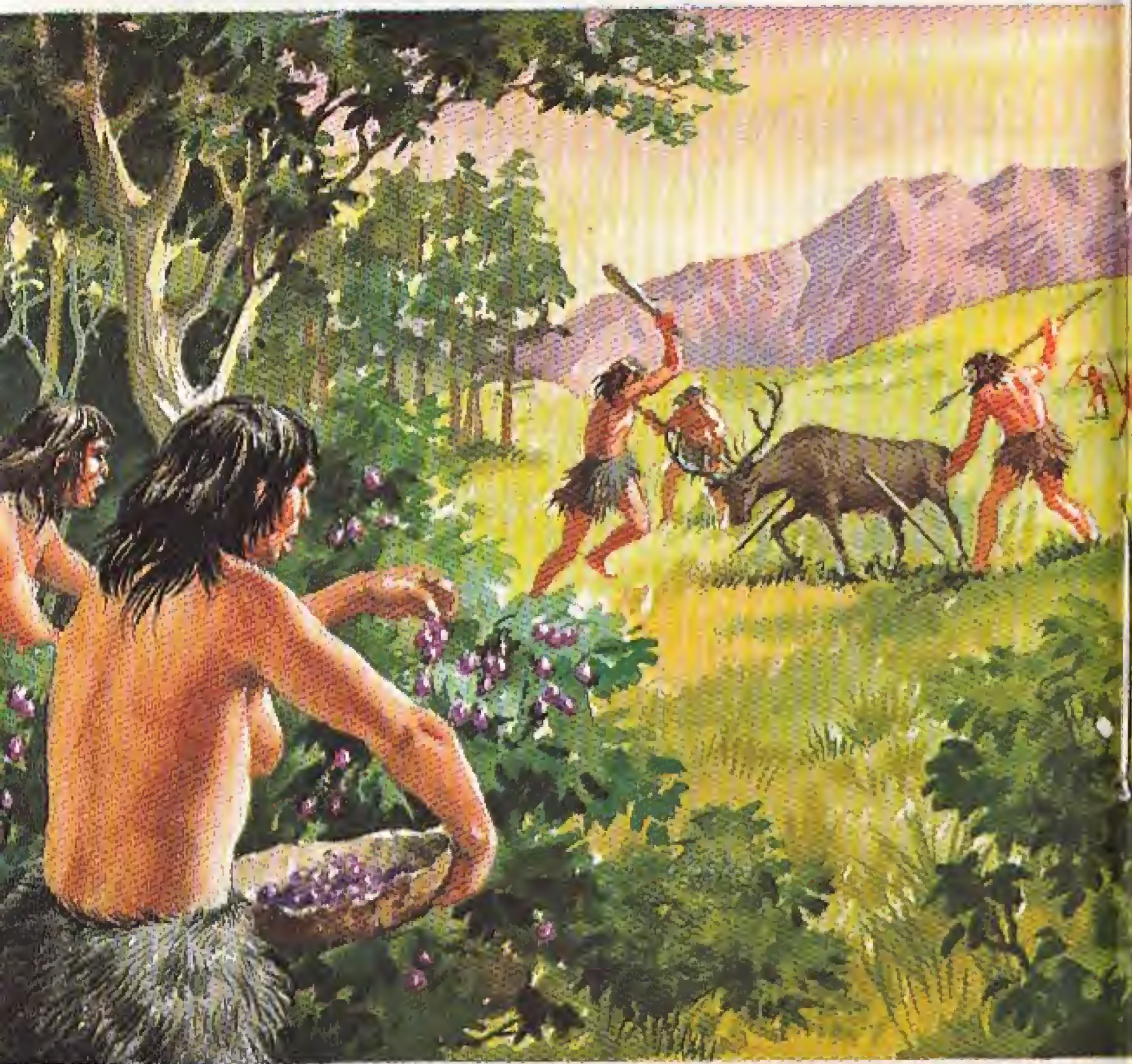


How the Earth was formed

The Earth was once a ball of fire.
The outside cooled
and formed a crust of rock.
The inside is still red hot.

A volcano is formed
when red-hot lava
bursts through the earth's surface.

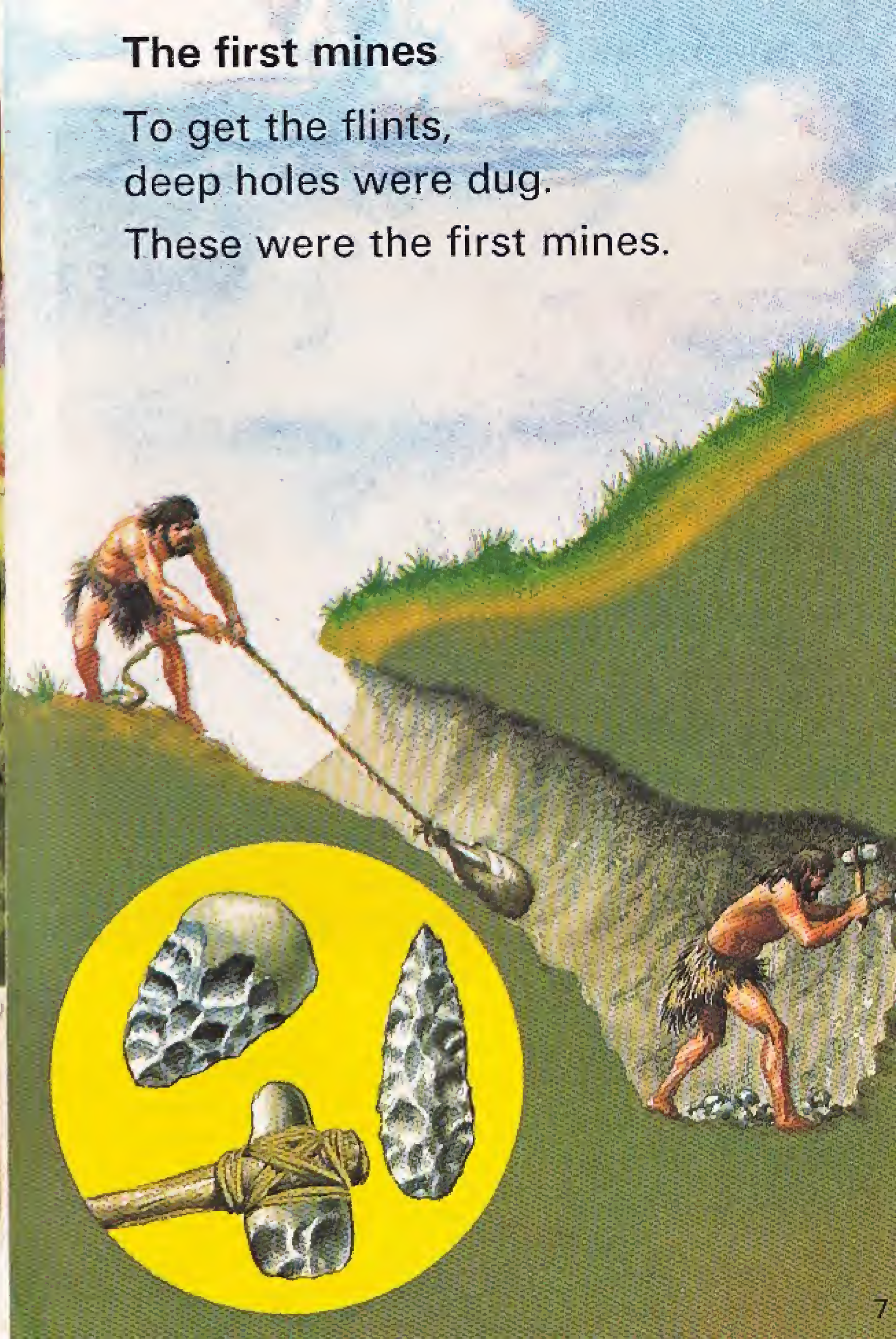
Weapons and tools of stone



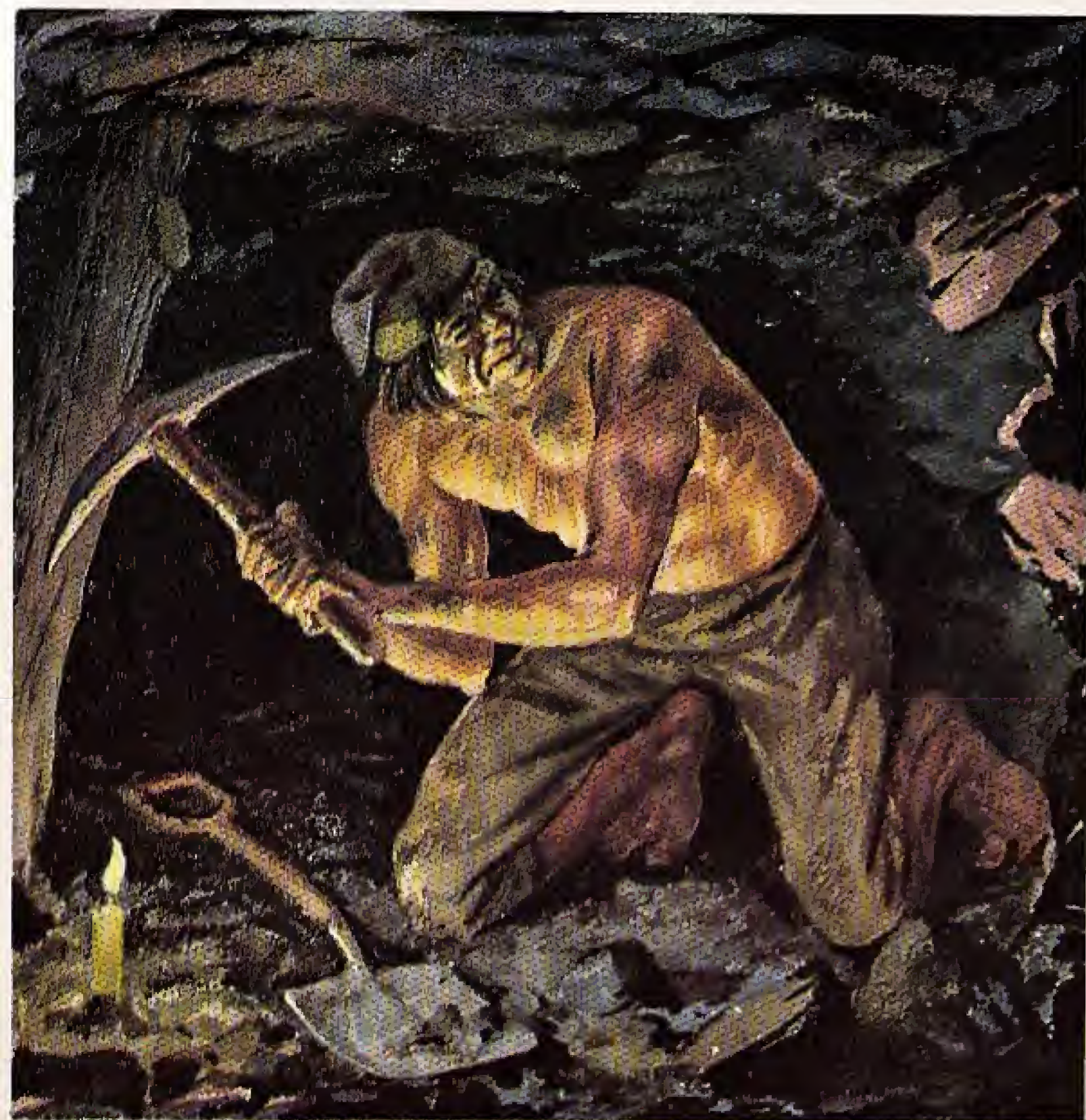
The first men and women ate plants and berries, and killed animals for food. They used flints (hard stones) for axes, hammers, spears and arrow heads.

The first mines

To get the flints, deep holes were dug. These were the first mines.



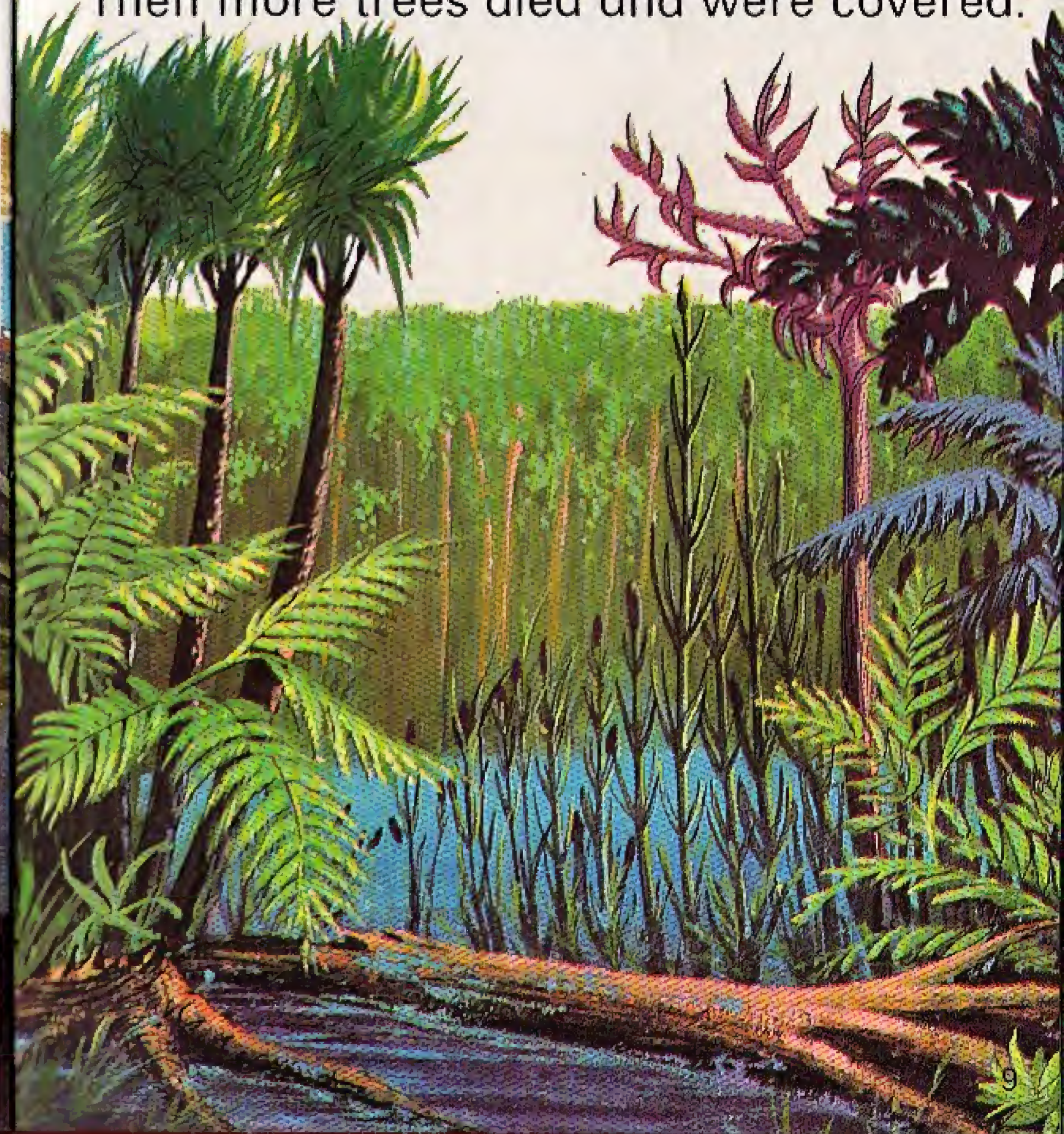
Deeper mines



Later, men had metal shovels and picks and could dig deeper holes to get tin, copper, iron and coal.

Coal

Long before there were men and women, forests were growing in the world. Trees died and rotted in swamps. Many layers of mud covered them. Then more trees died and were covered.



Bigger mines



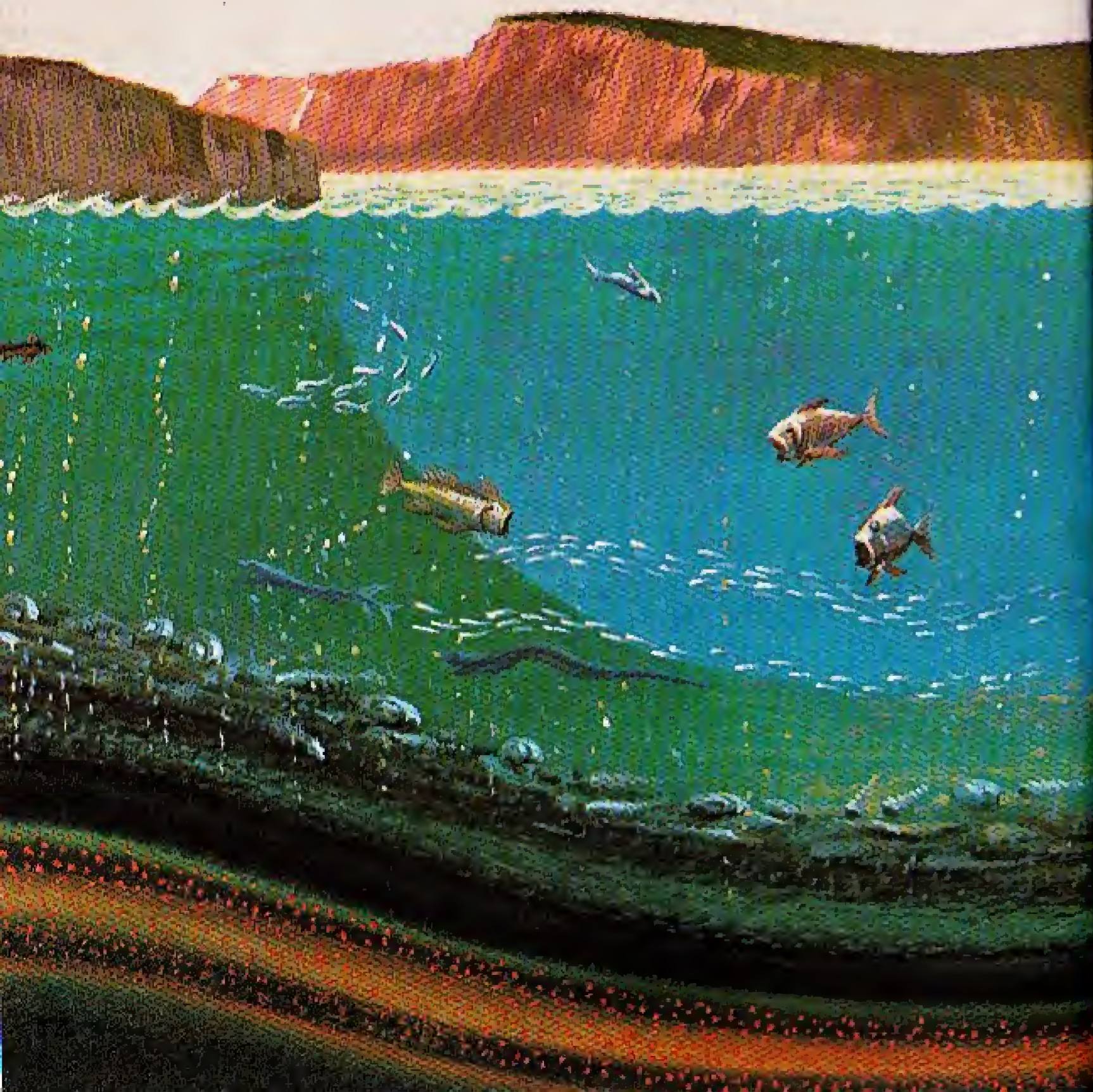
Modern mines are very big.
Machines do much of the work.
Everything possible is done
to make mining safe.



But mining can still be dangerous.
A gas (called firedamp) sometimes
explodes. A tunnel roof may fall in.
Water may flood a tunnel.

Oil

Millions of years ago,
tiny sea creatures died
and sank to the sea bed.
Mud and sand sank on top of them.
Slowly their bodies changed into oil.



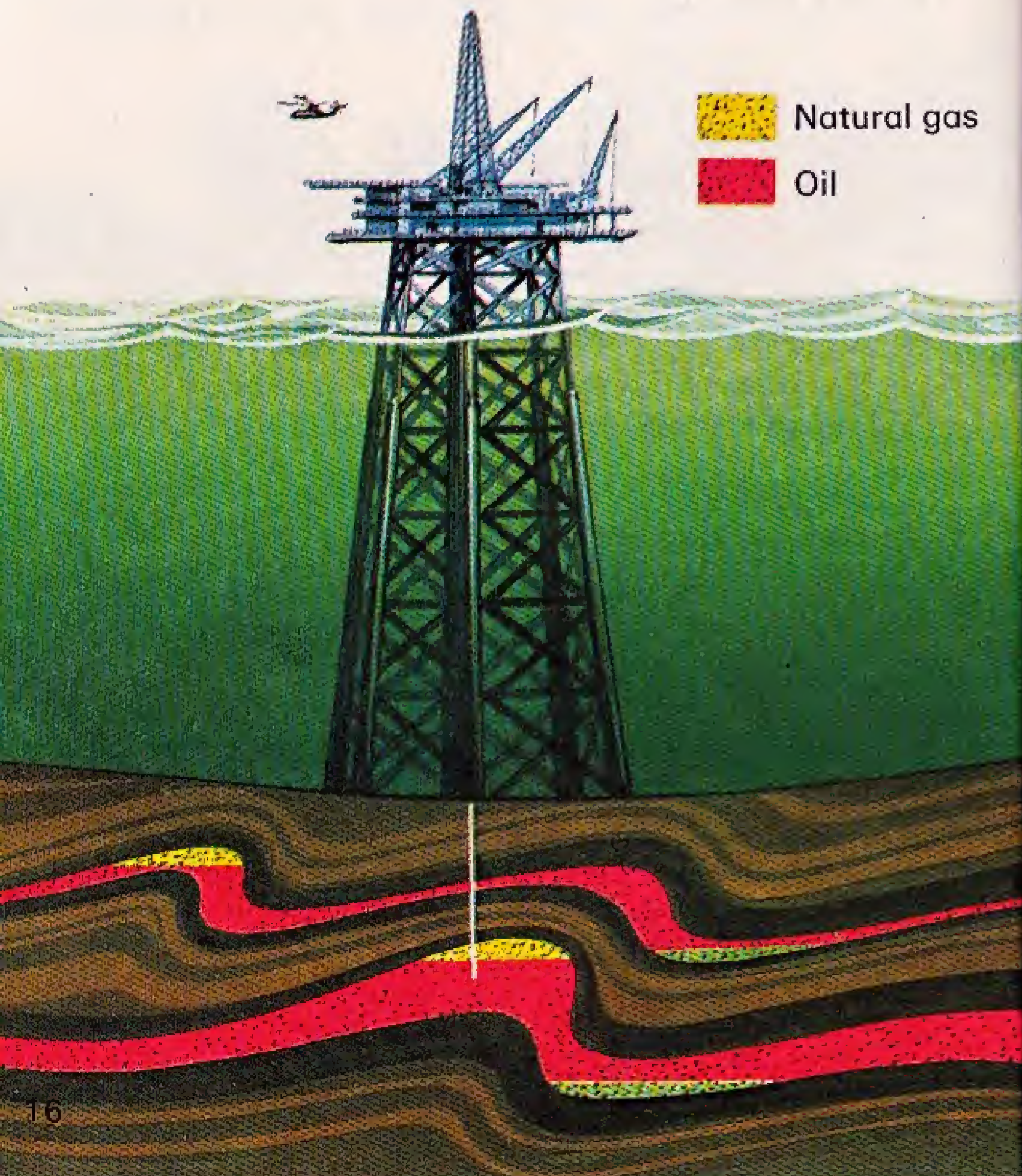
Today, oil is found under the sea-bed
and where the sea used to be.
There is oil under this desert.
Find out where there are oilfields
in the world.



Natural gas

Natural gas, as well as oil, is found under the sea-bed.

Oil rigs like this are used to drill under the sea.



Men live and work on these rigs.
Helicopters and ships
bring food and other things they need.



Metals and precious stones

*Silver brooch
with topaz*



*Gold ring
with diamonds*



Gold watch



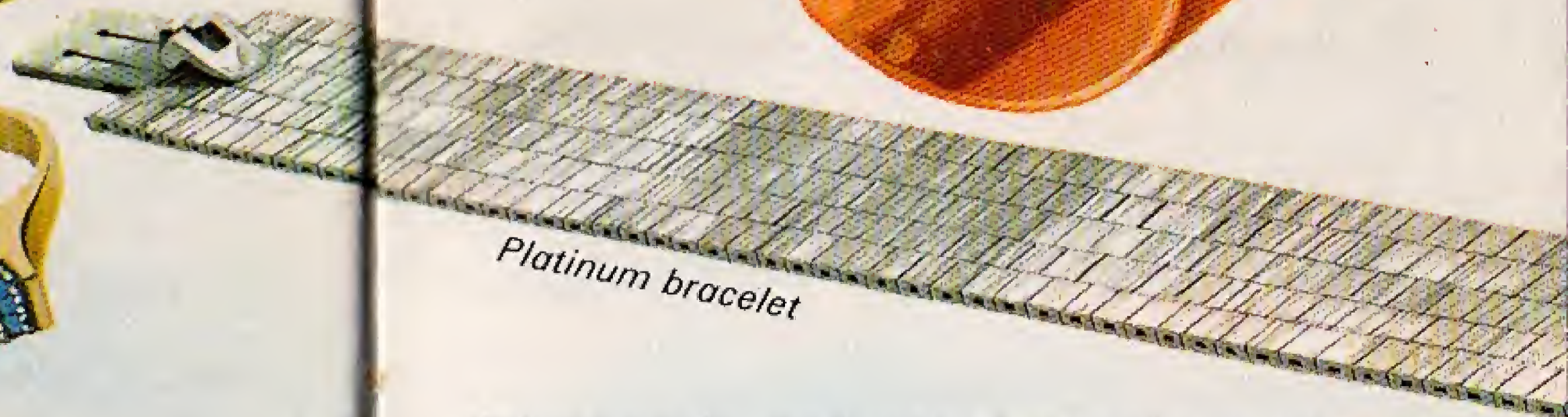
*Gold ring
with sapphire stones*



*Copper
bracelet*



Platinum bracelet



Some kinds of rock have minerals in them. Iron, copper, silver, gold and other metals are all minerals.

Diamonds and other precious stones are minerals. This jewellery was made with minerals from under the ground.

Salt



Millions of years ago,
when a sea or salt-water lake dried up,
the salt was left behind.
Later it was covered by mud and rock.
Today we dig it out.

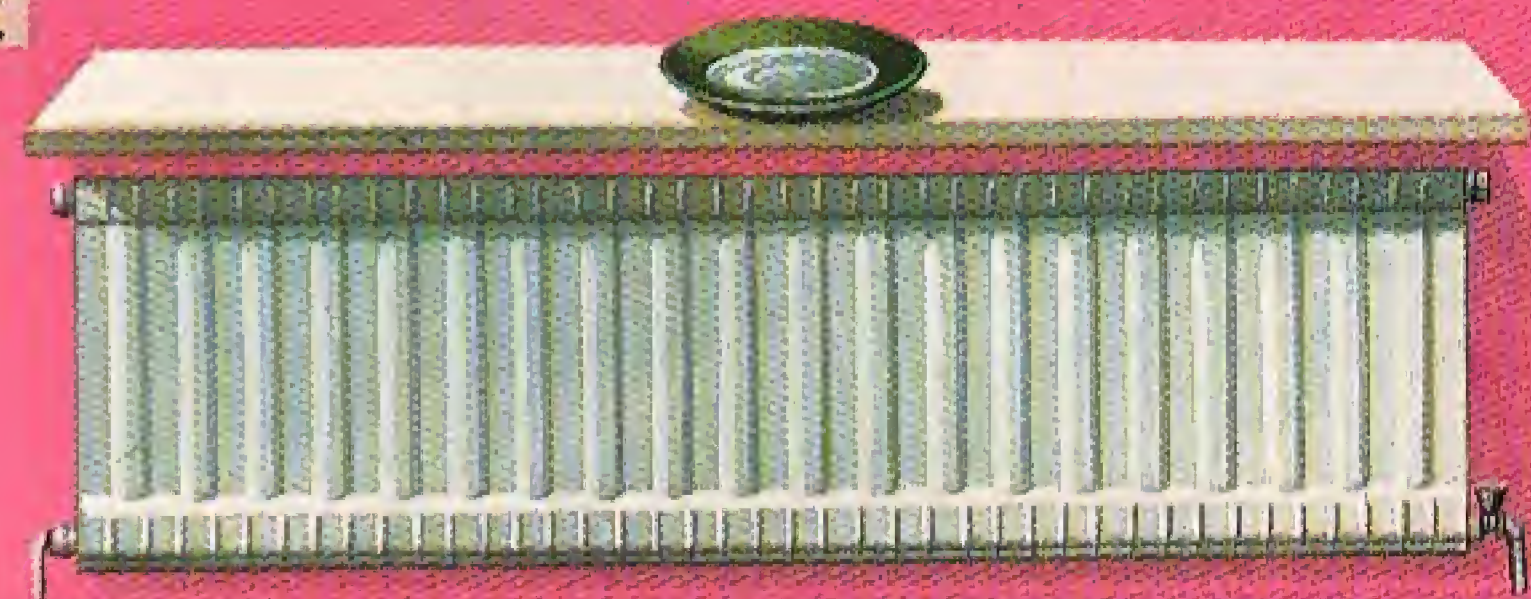
See what happens

1



Put some very salty water
in a saucer.

2



Leave the saucer in a warm room.

3

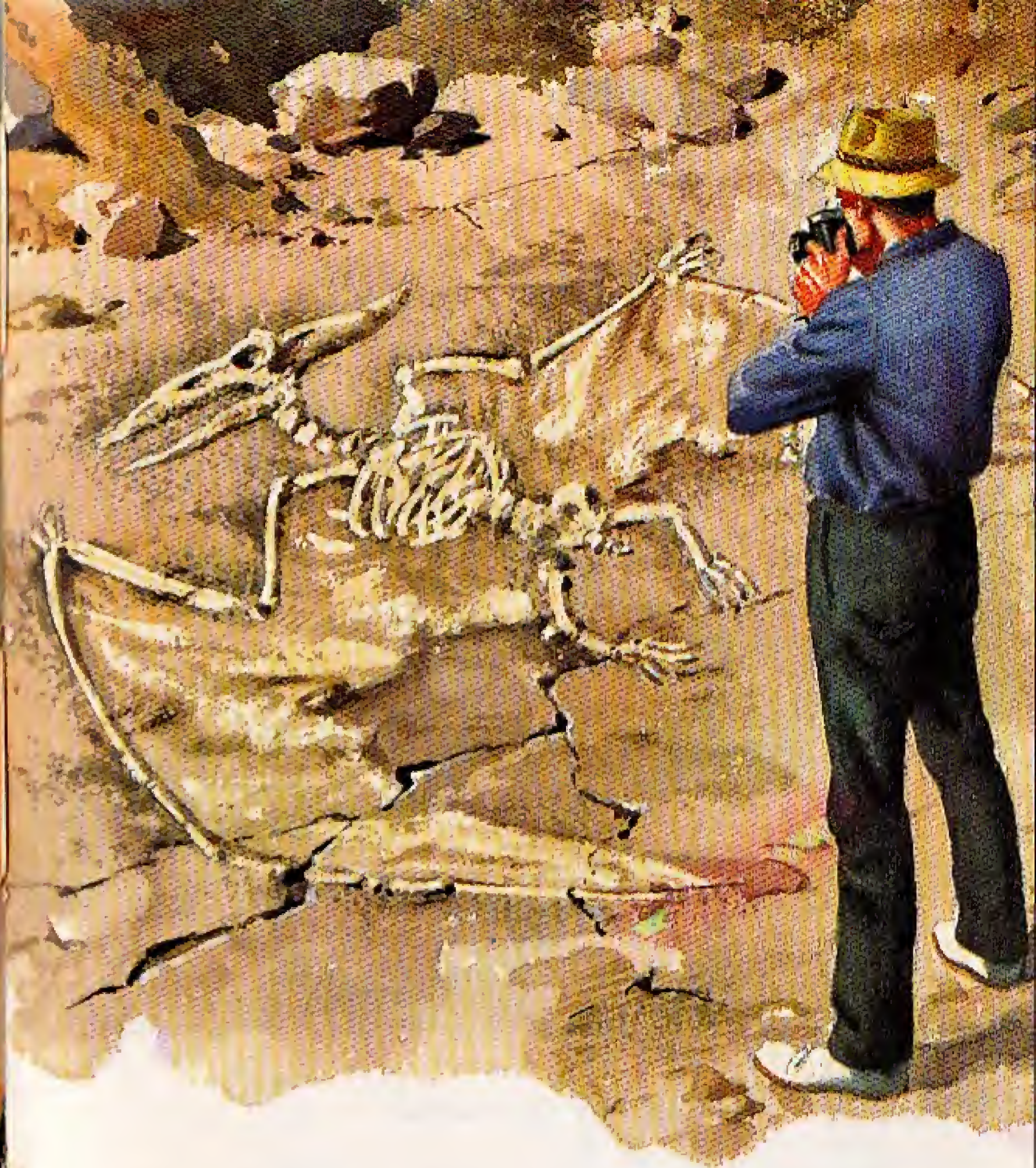
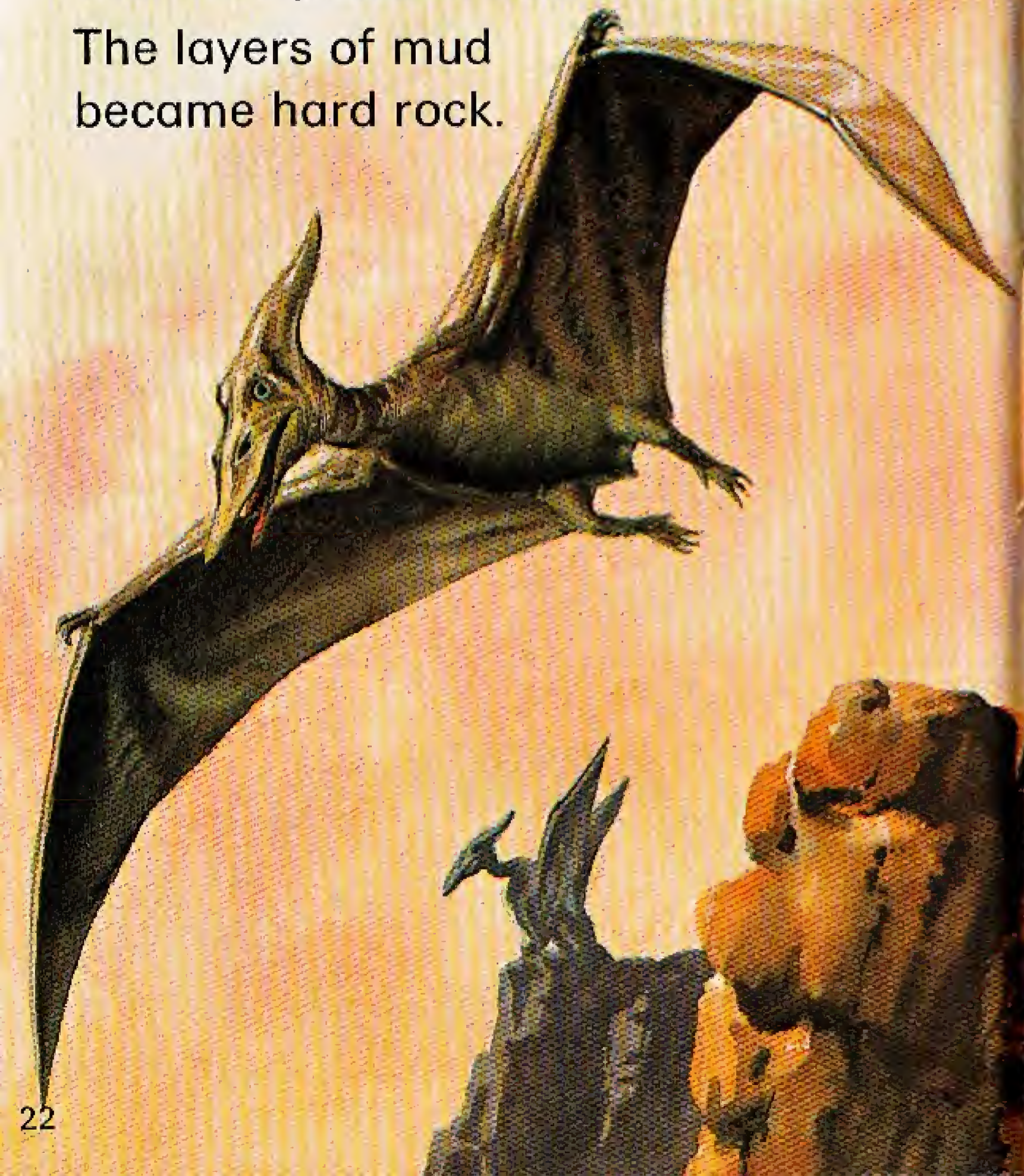


See what happens
when the water dries up!

Fossils

Once there were animals like this.
When they died, some were covered
by mud.

The mud pressed round their bodies.
The layers of mud
became hard rock.



The shapes of animals and fish
can still be found in some rocks.
They are called fossils.

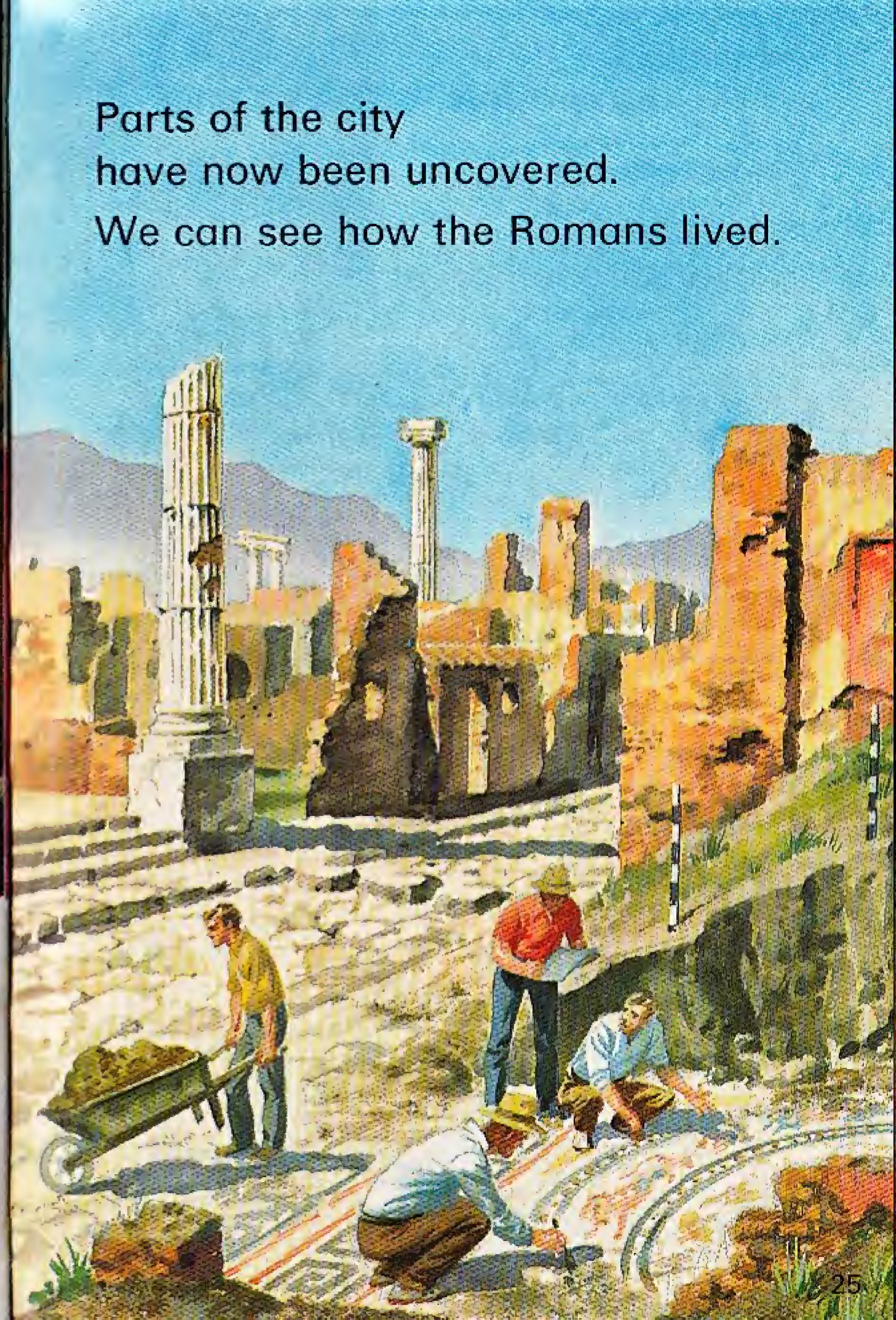


History under the ground

The fine Roman city of Pompeii was built near a volcano.

In 79 AD the city was buried deep under hot ashes from the volcano.

Parts of the city
have now been uncovered.
We can see how the Romans lived.

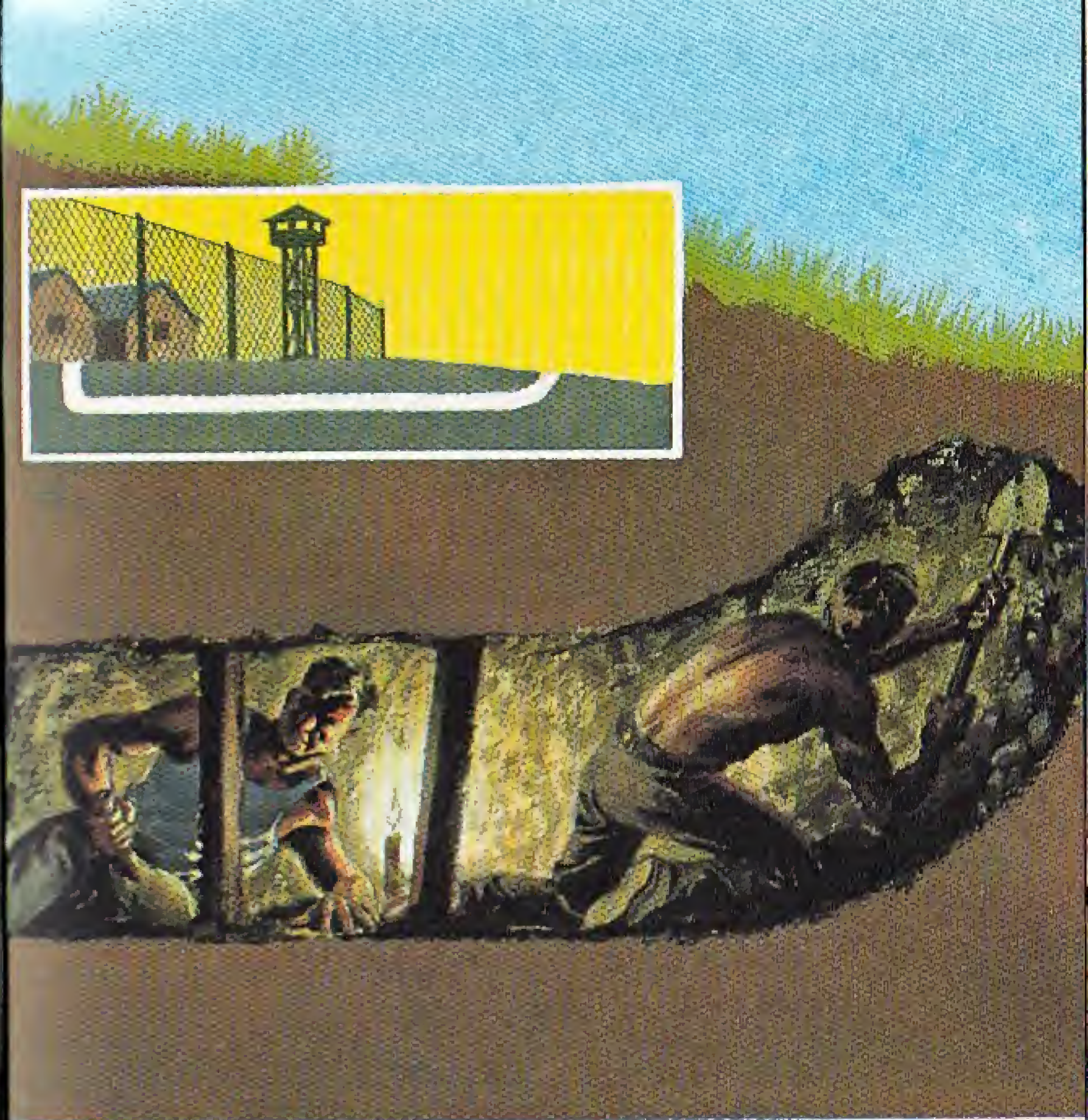


Exploring under the ground

Some people like exploring in underground caves and tunnels.

They wear special clothes and helmets and need ropes and torches.

Potholers

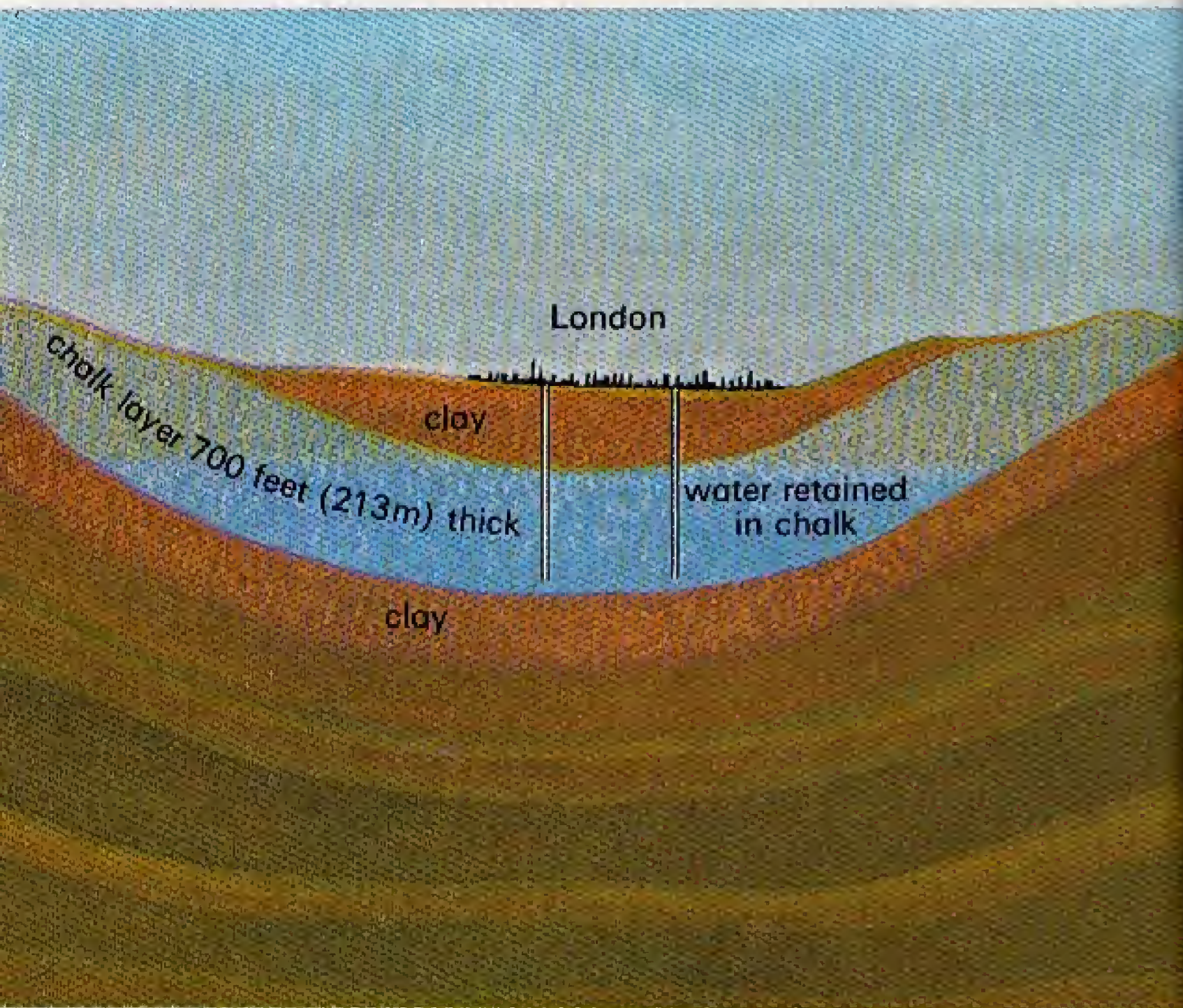


Escaping under the ground

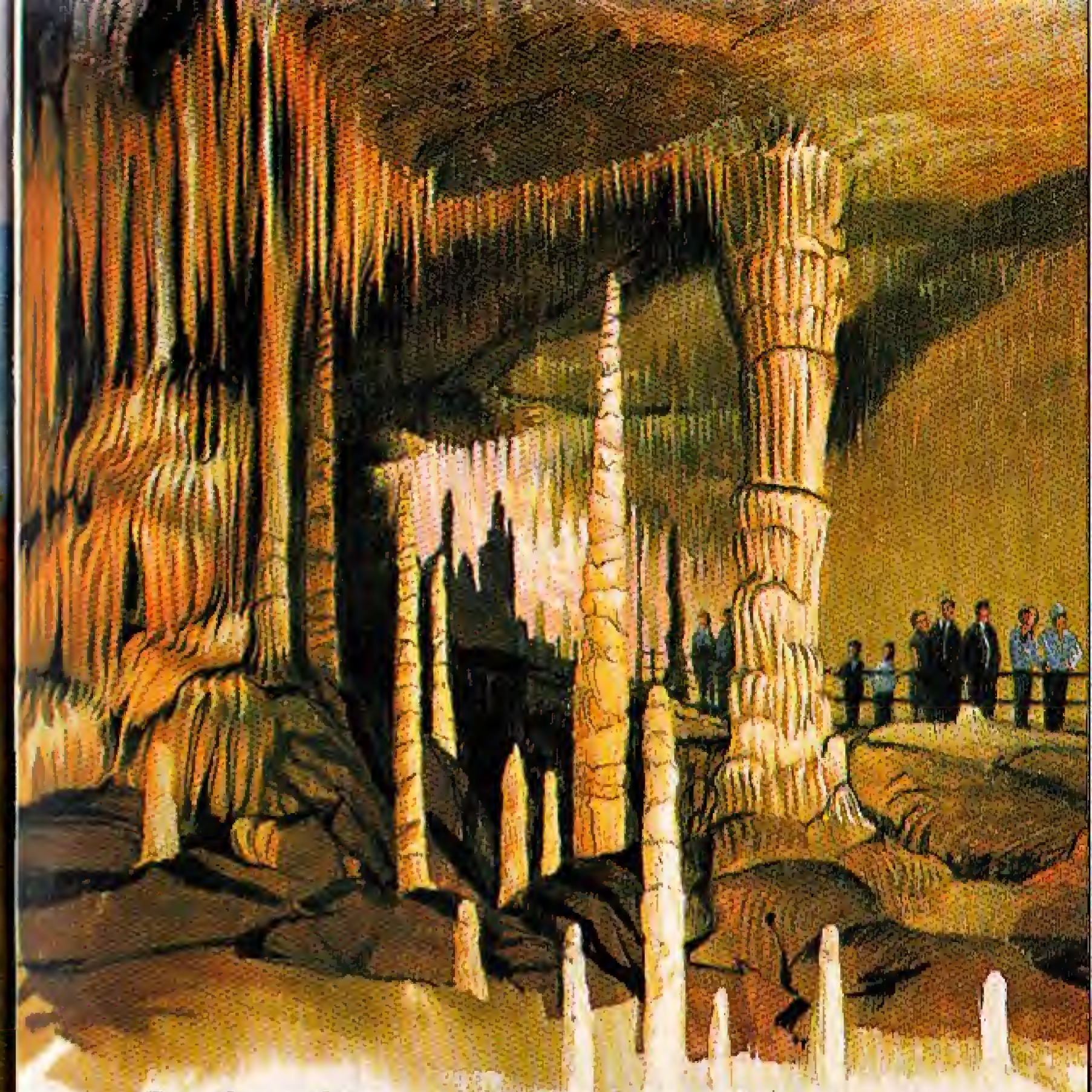
Sometimes prisoners-of-war dig long tunnels beneath their prison fences.

Through them they escape to freedom.

Drinking water from under the ground



Rain can soak down into chalk.
It cannot soak into clay.
If the clay is under the chalk,
the water stays in the chalk.
It can be pumped up and used.



Stalactites and stalagmites

When water soaks through limestone,
it takes some of the lime with it.
When it drips from a cave roof,
the lime forms stalactites which hang
and stalagmites which stand upright.

A road under the ground

This road runs under the ground
and also under a river.

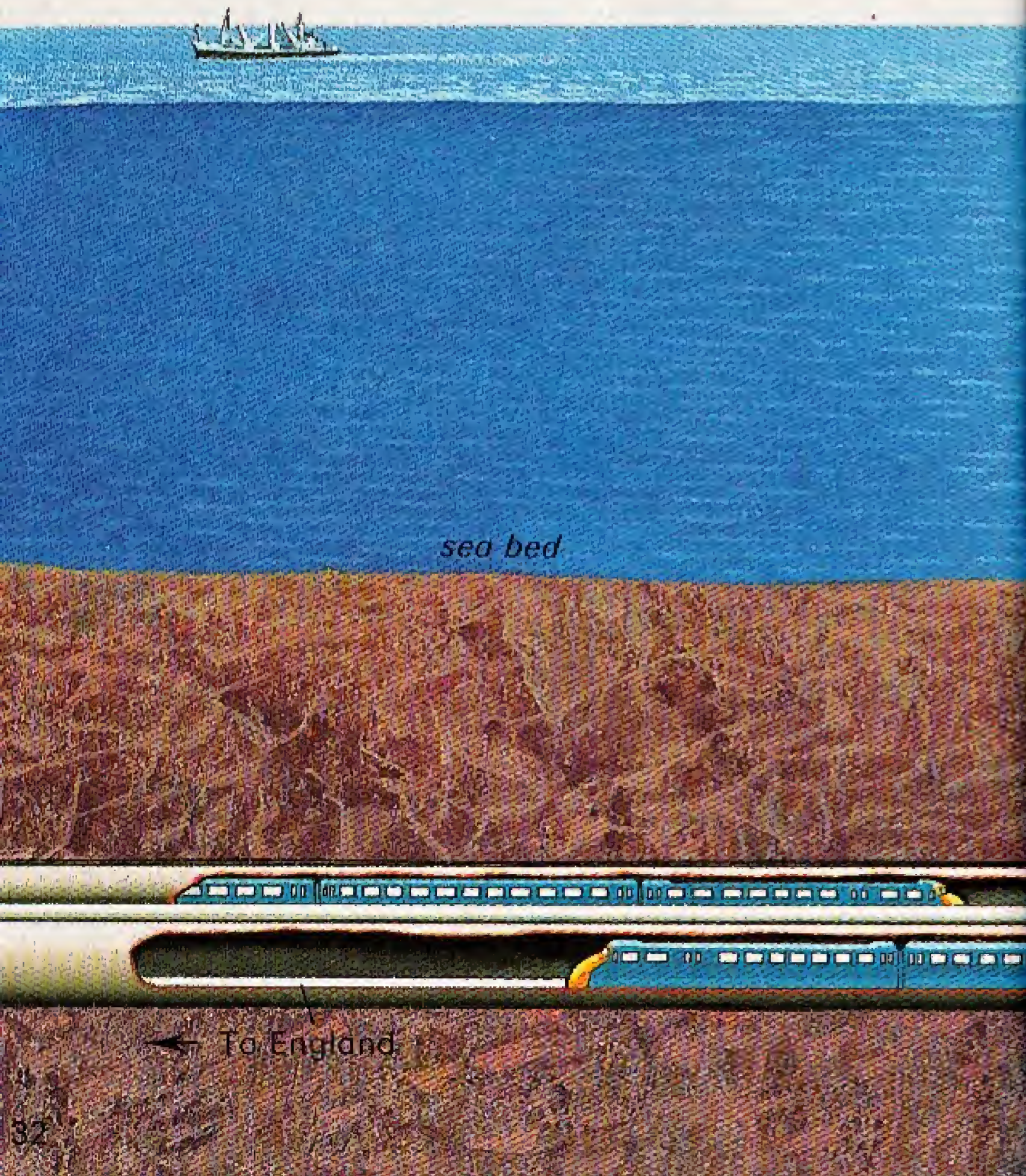
It is the Mersey tunnel.

Look for it on your map of England.

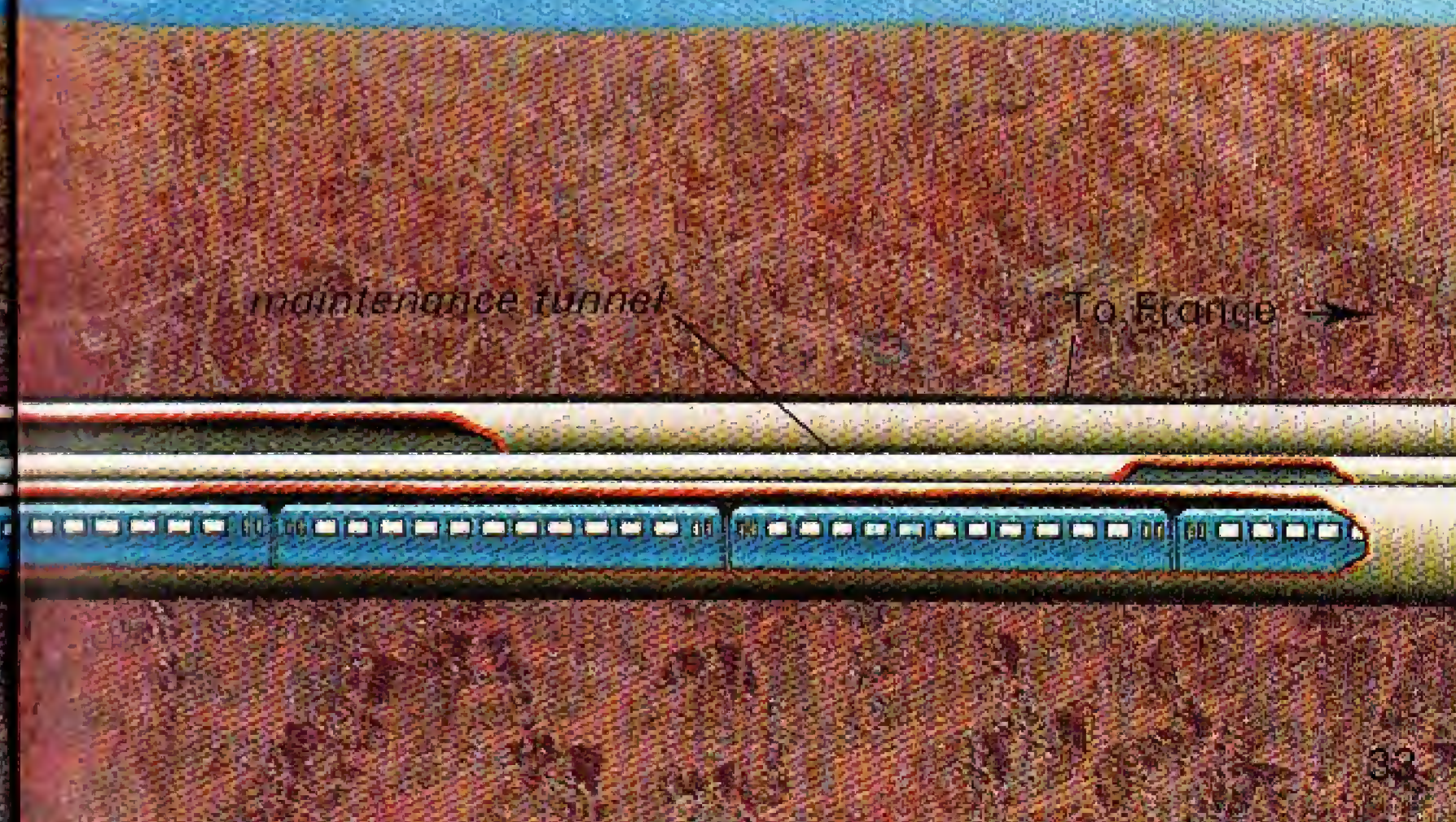
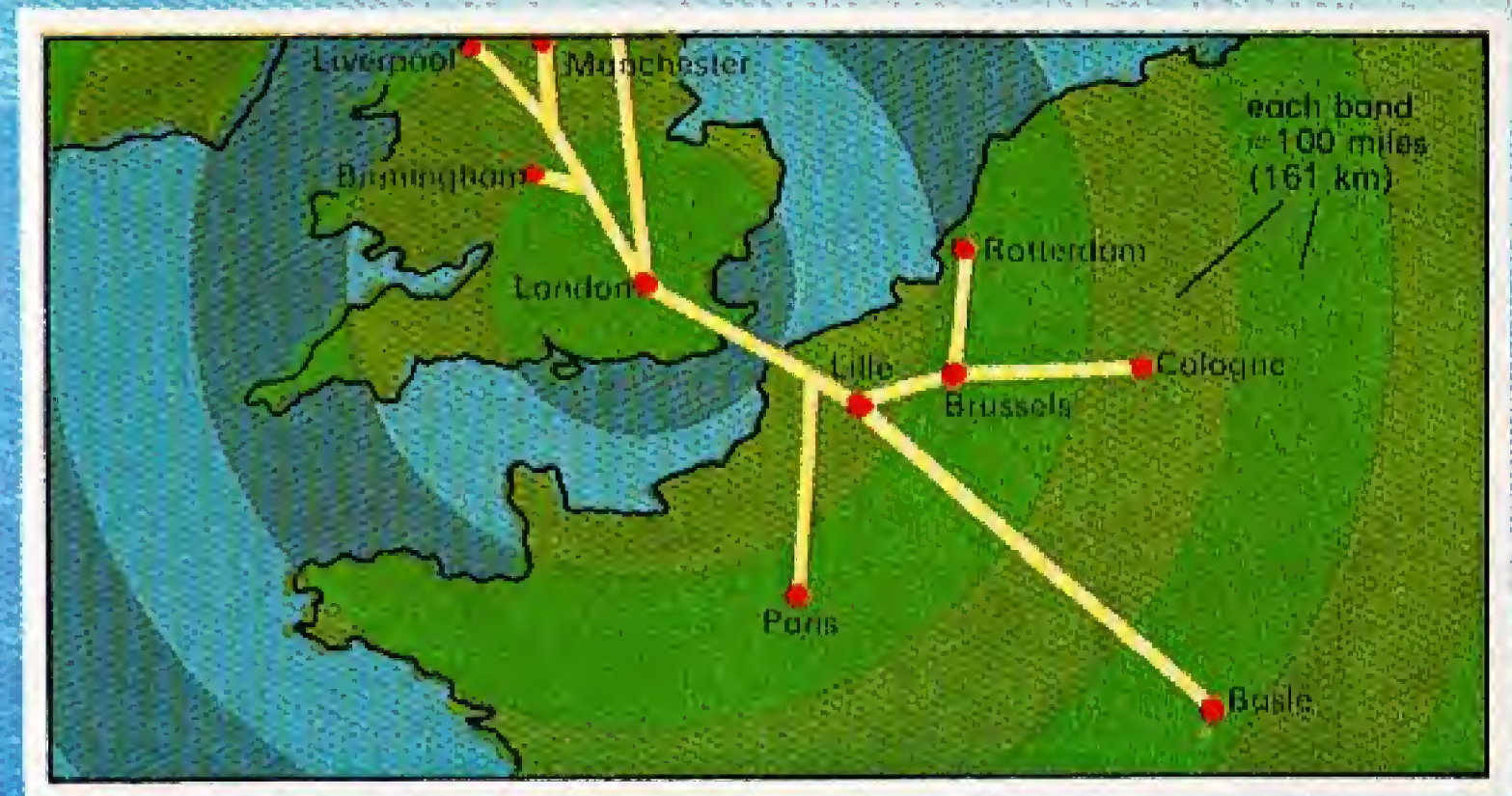


A railway under the sea

If this tunnel is built,
it will be the longest in the world.



It will be under the English Channel
and join England and France.



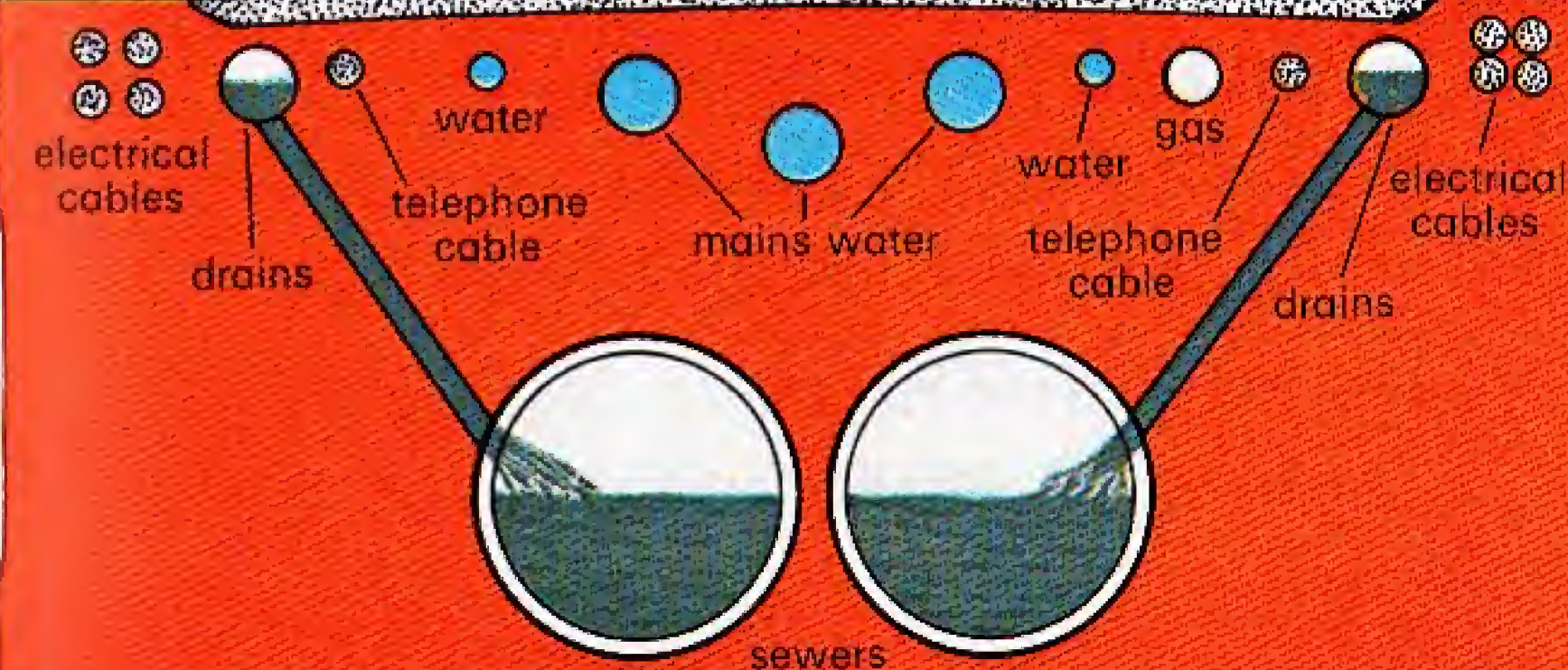
A railway under a city

Some cities have railways that run under the ground. If people travel on these, the roads are less crowded.

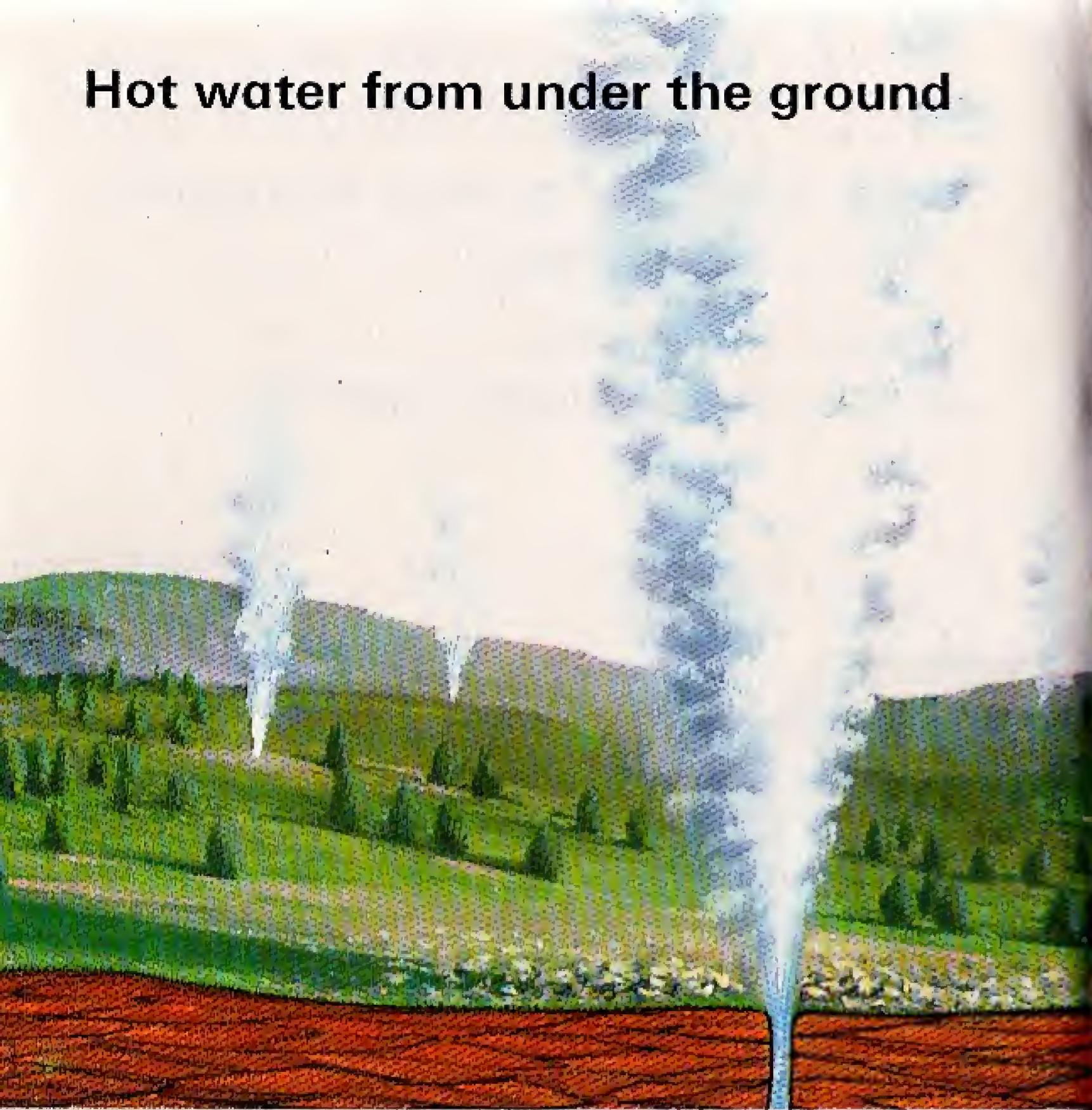


Pipes and cables under a city

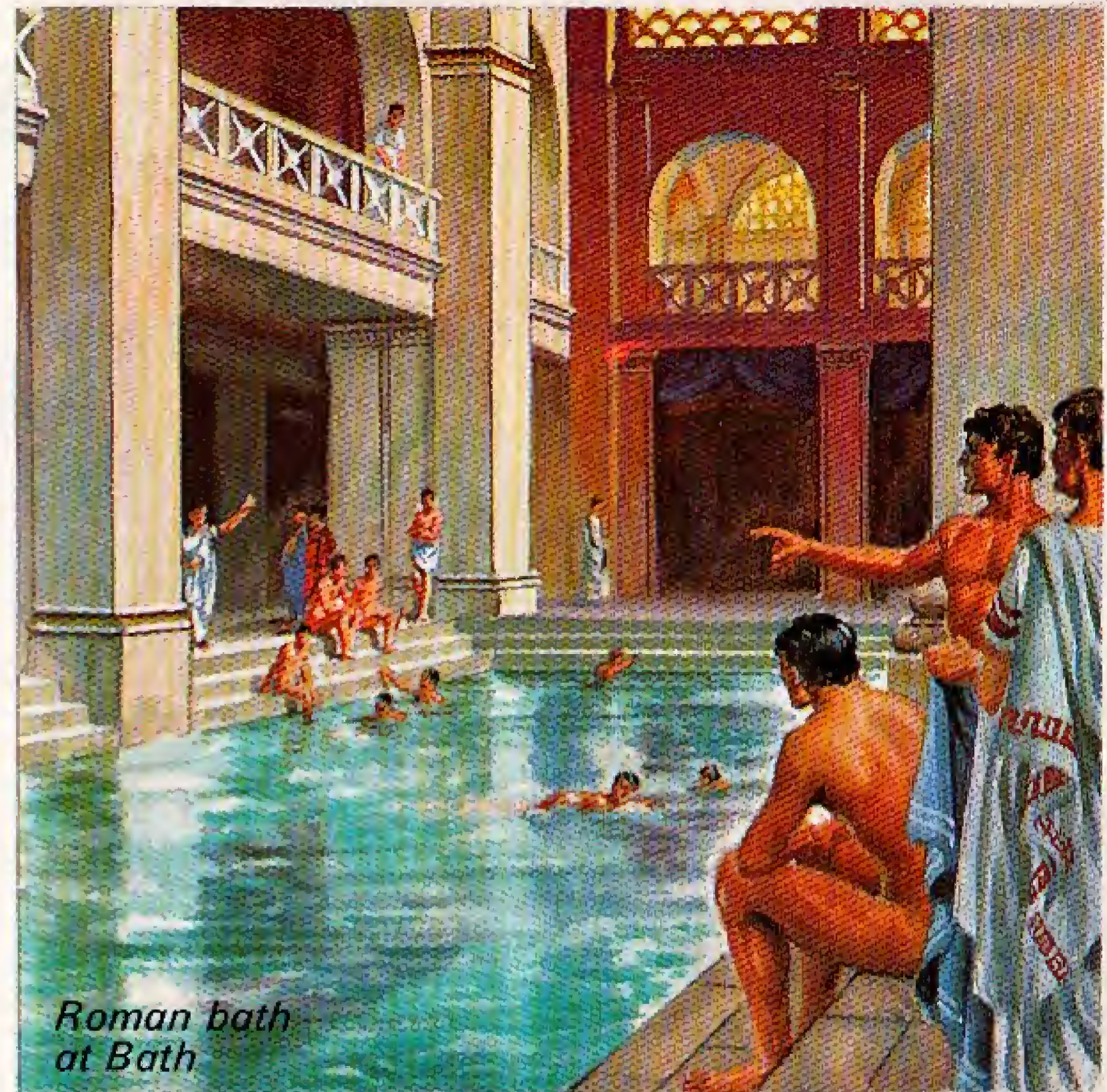
There are many pipes and cables under a city street. The picture shows what some of them could be.



Hot water from under the ground

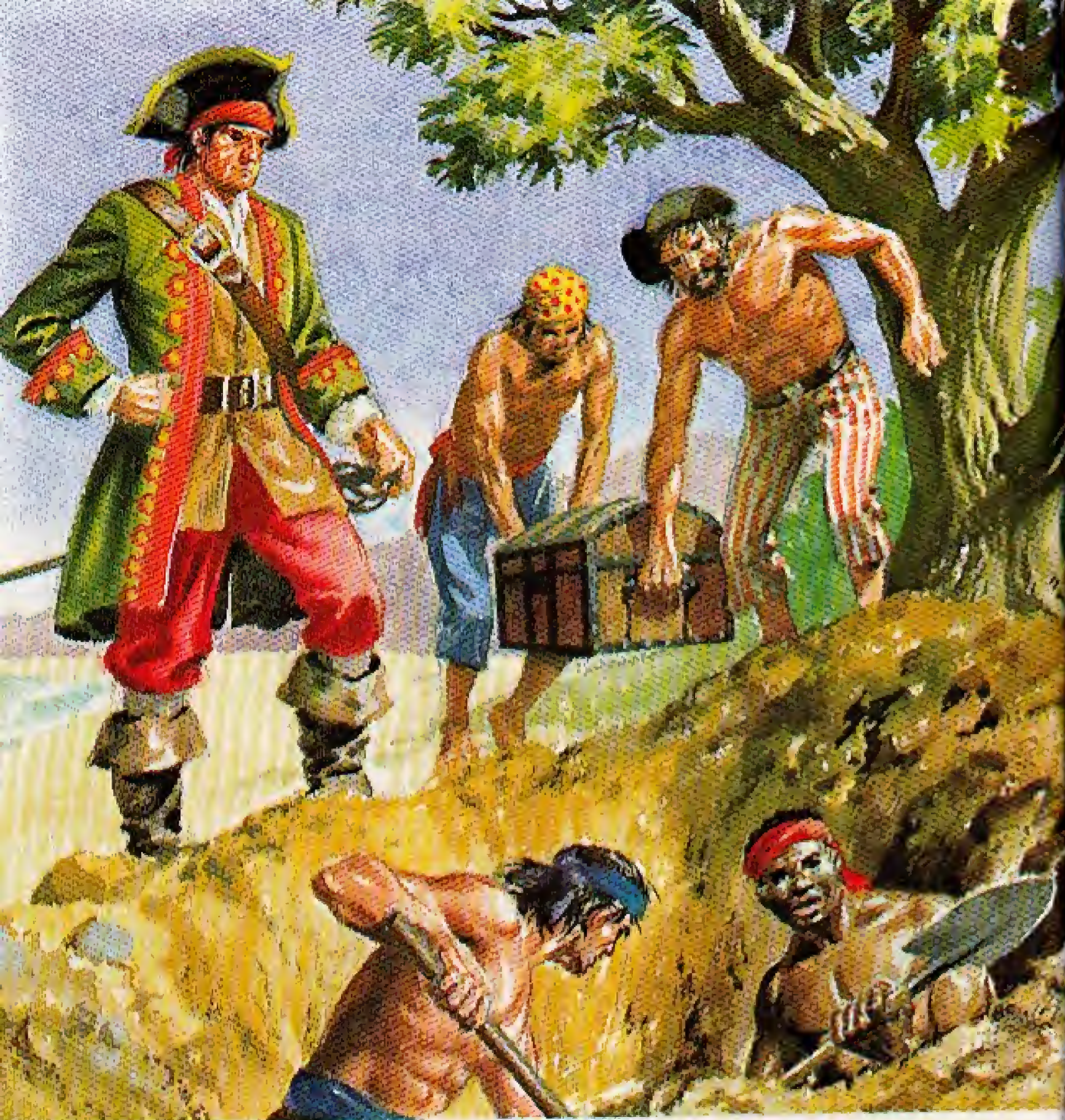


In Iceland, New Zealand,
and some other places,
underground streams get hot.
The water boils.
Steam and spray gush out.

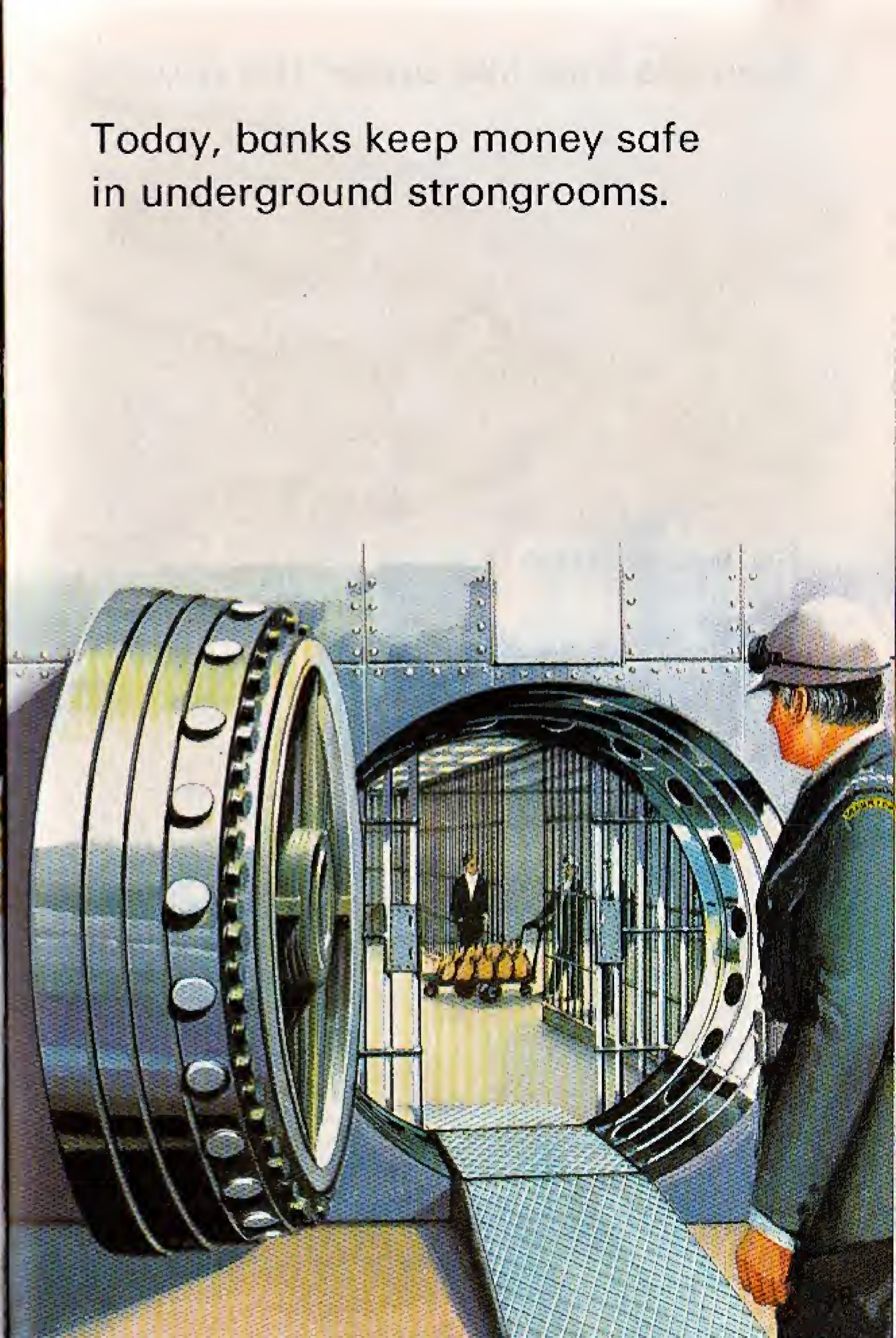


*Roman bath
at Bath*

This bath was built by the Romans.
It is filled by a hot stream
from under the ground.
Today, 2,000 years later, it still flows
at the same speed and temperature.



Today, banks keep money safe
in underground strongrooms.

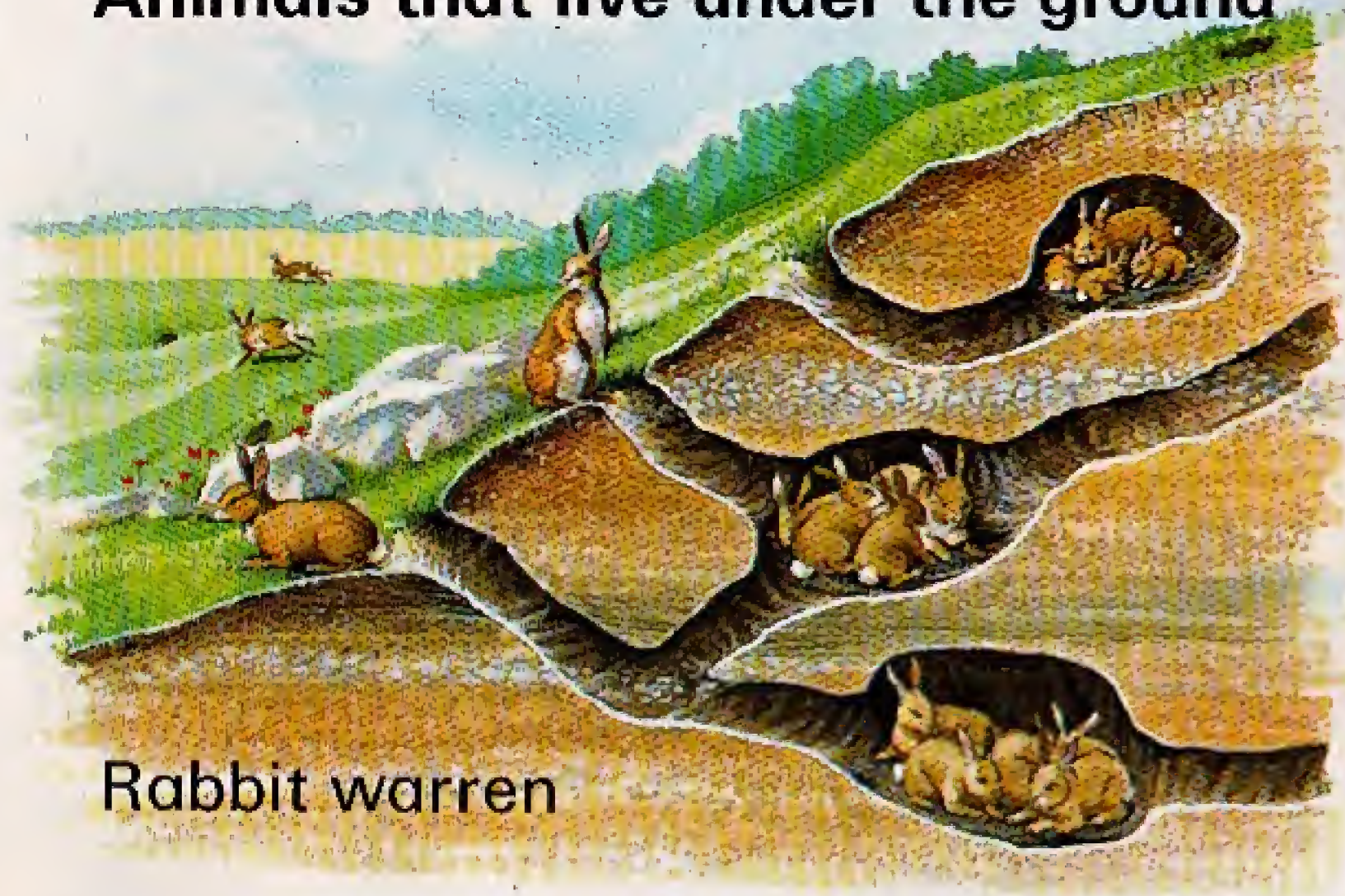


Money under the ground

Often pirates hid their treasure
in holes in the ground.

These holes made safe hiding places.

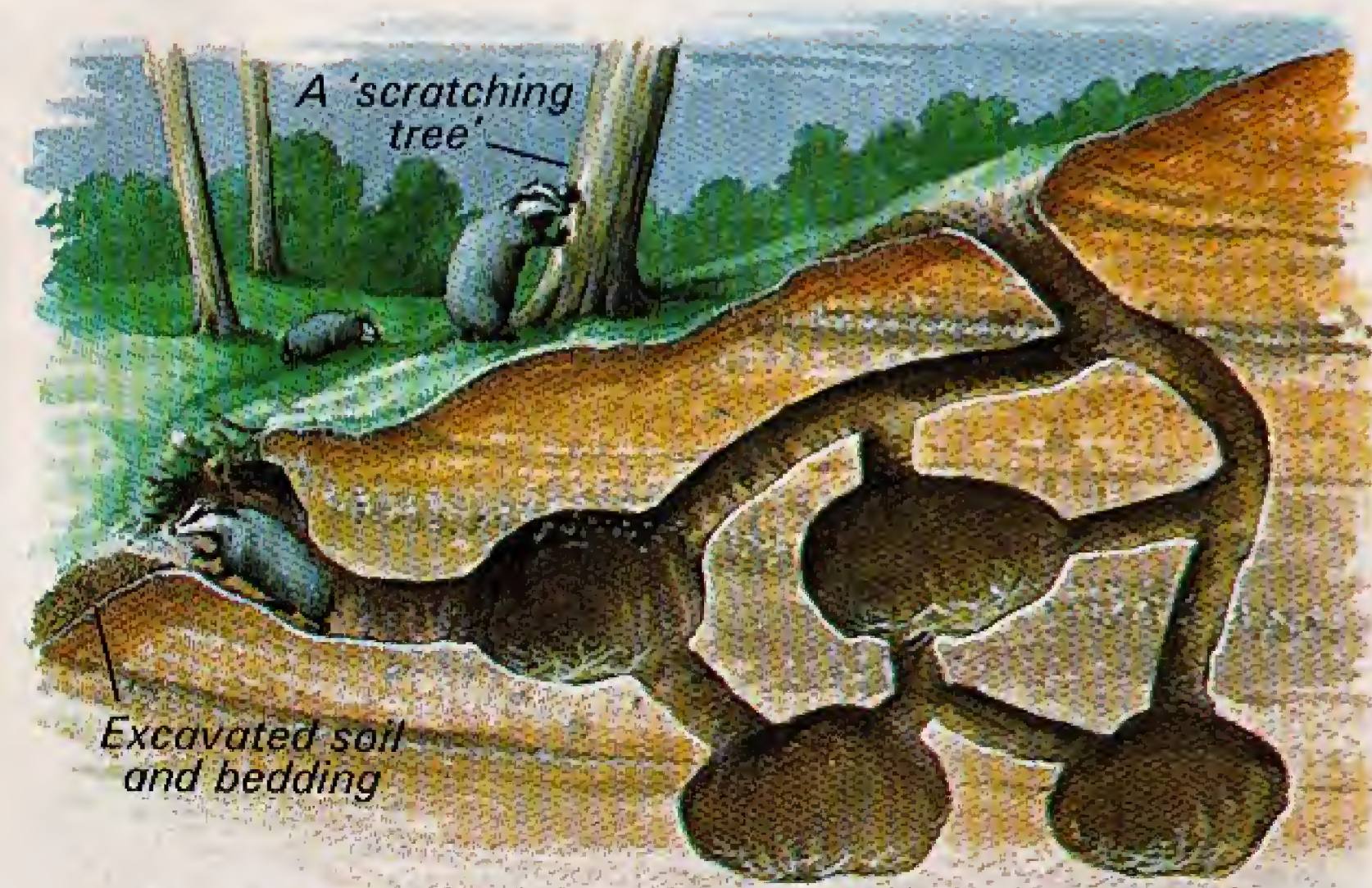
Animals that live under the ground



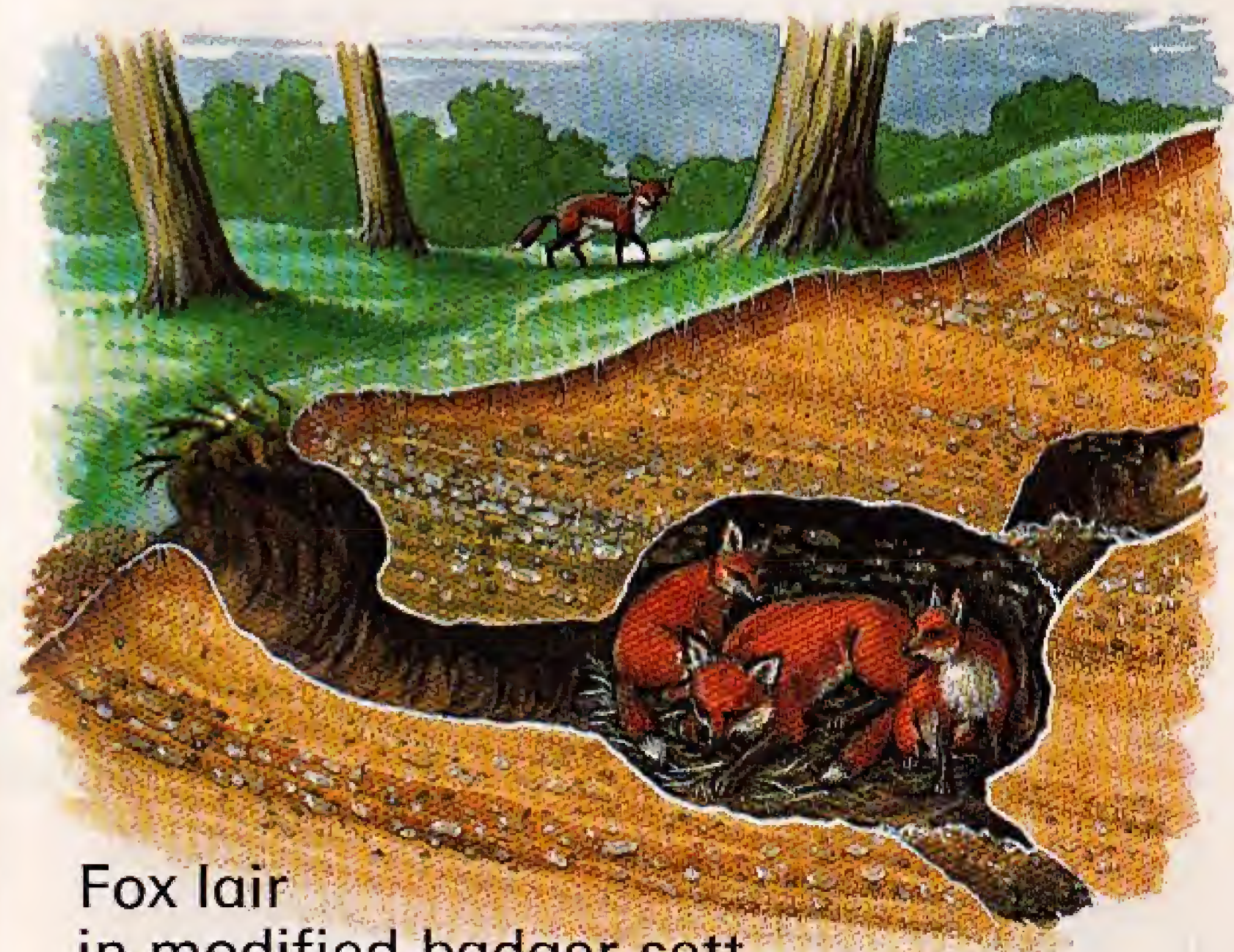
Rabbit warren



Mole fortress

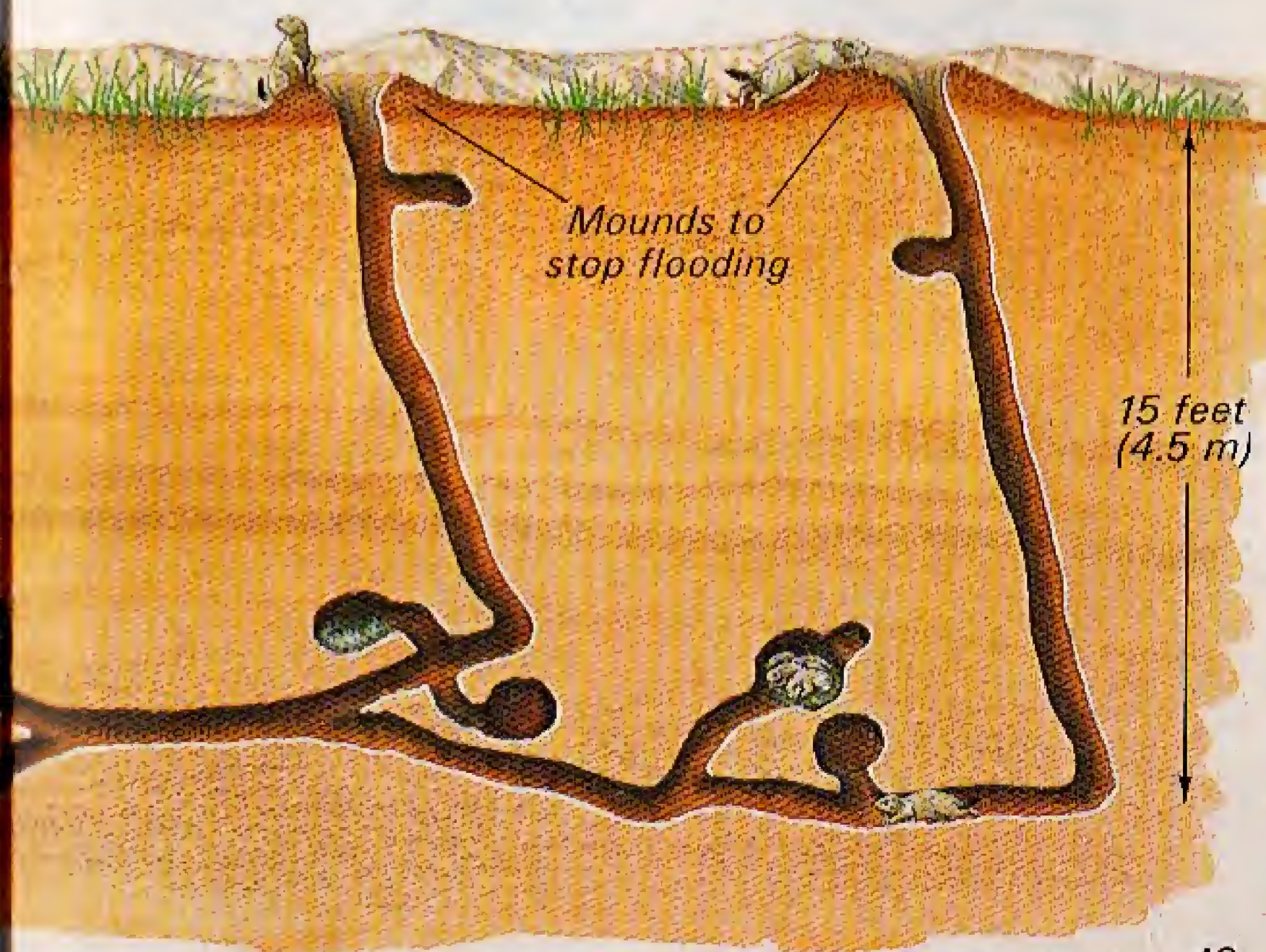
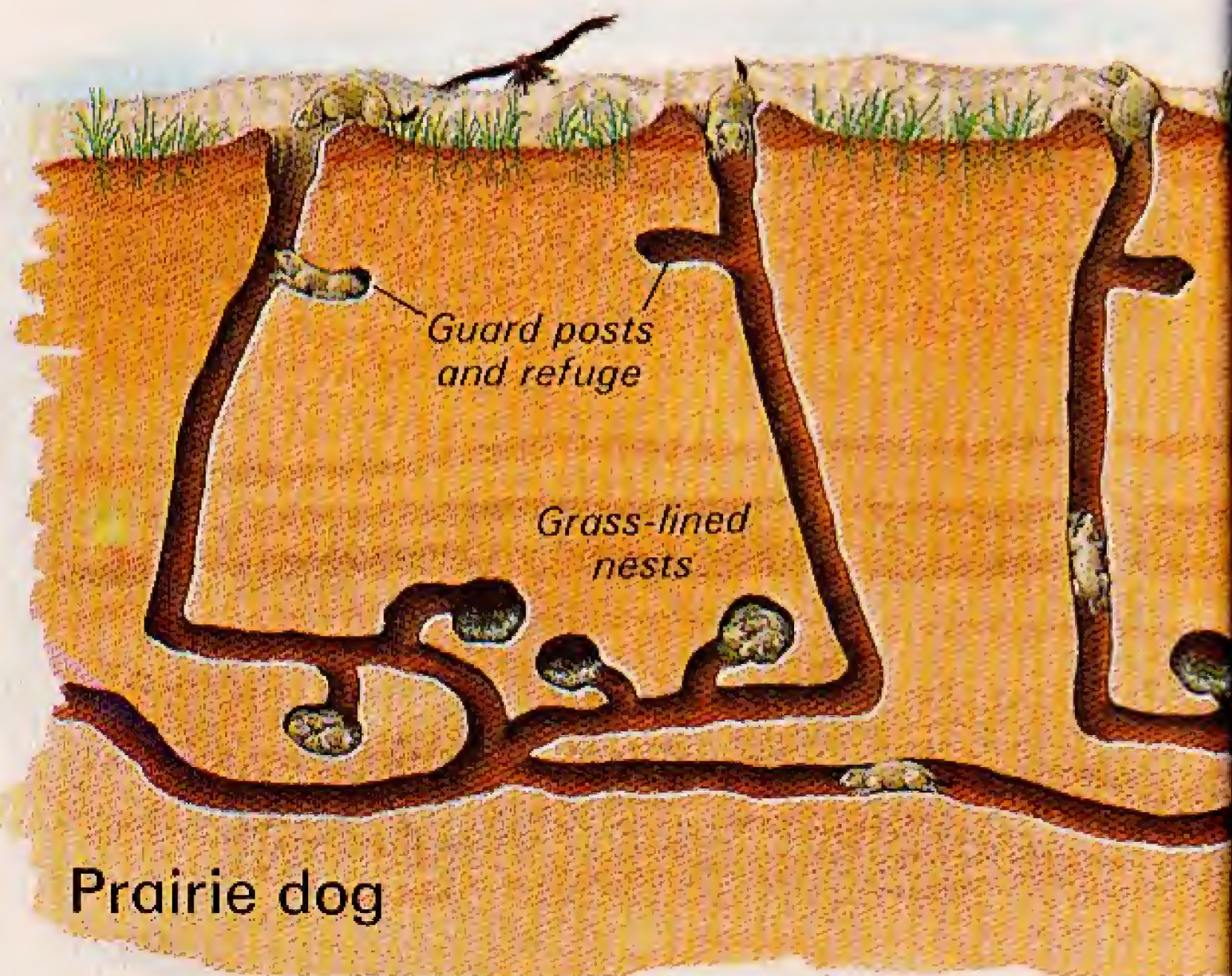
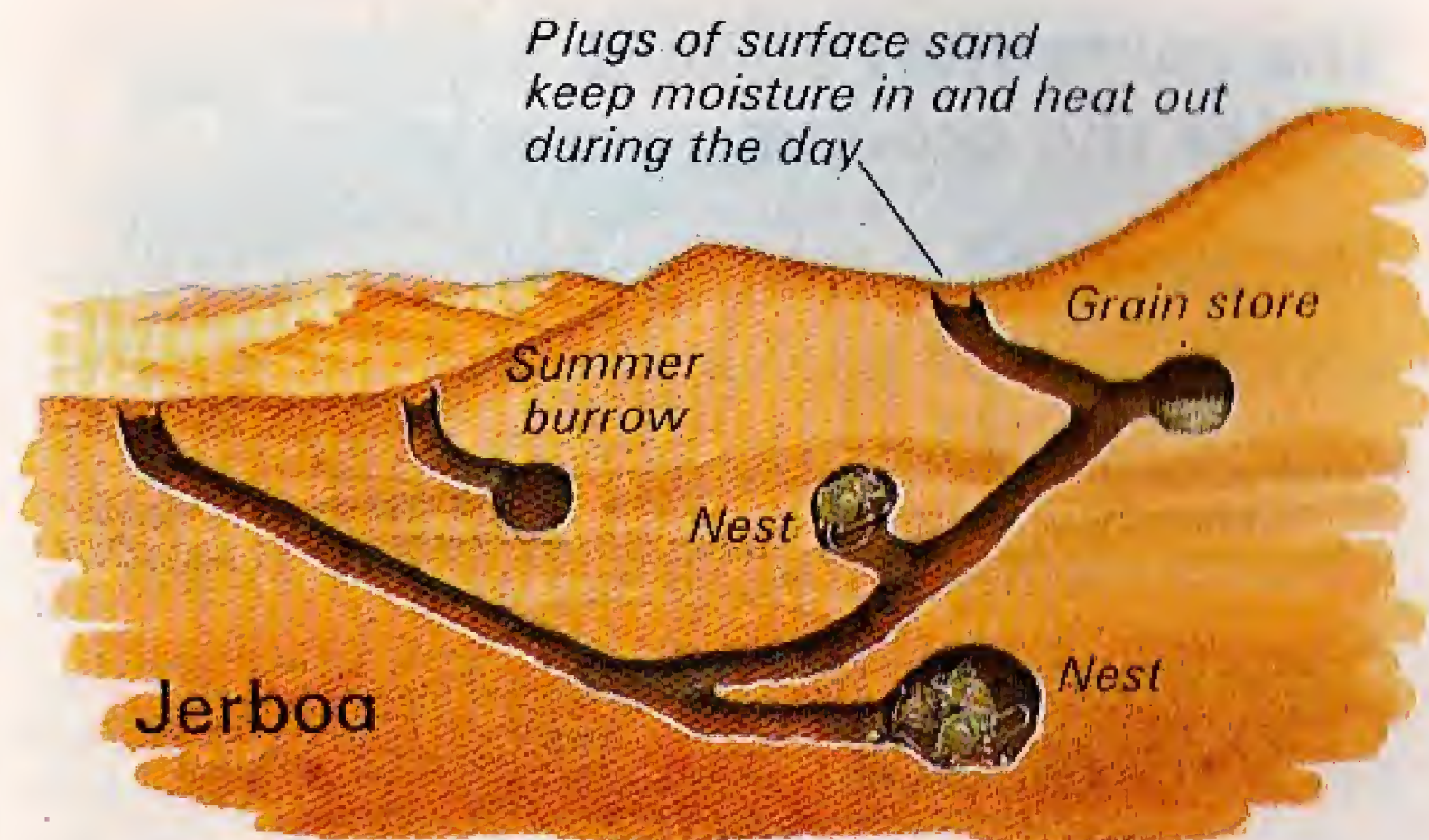
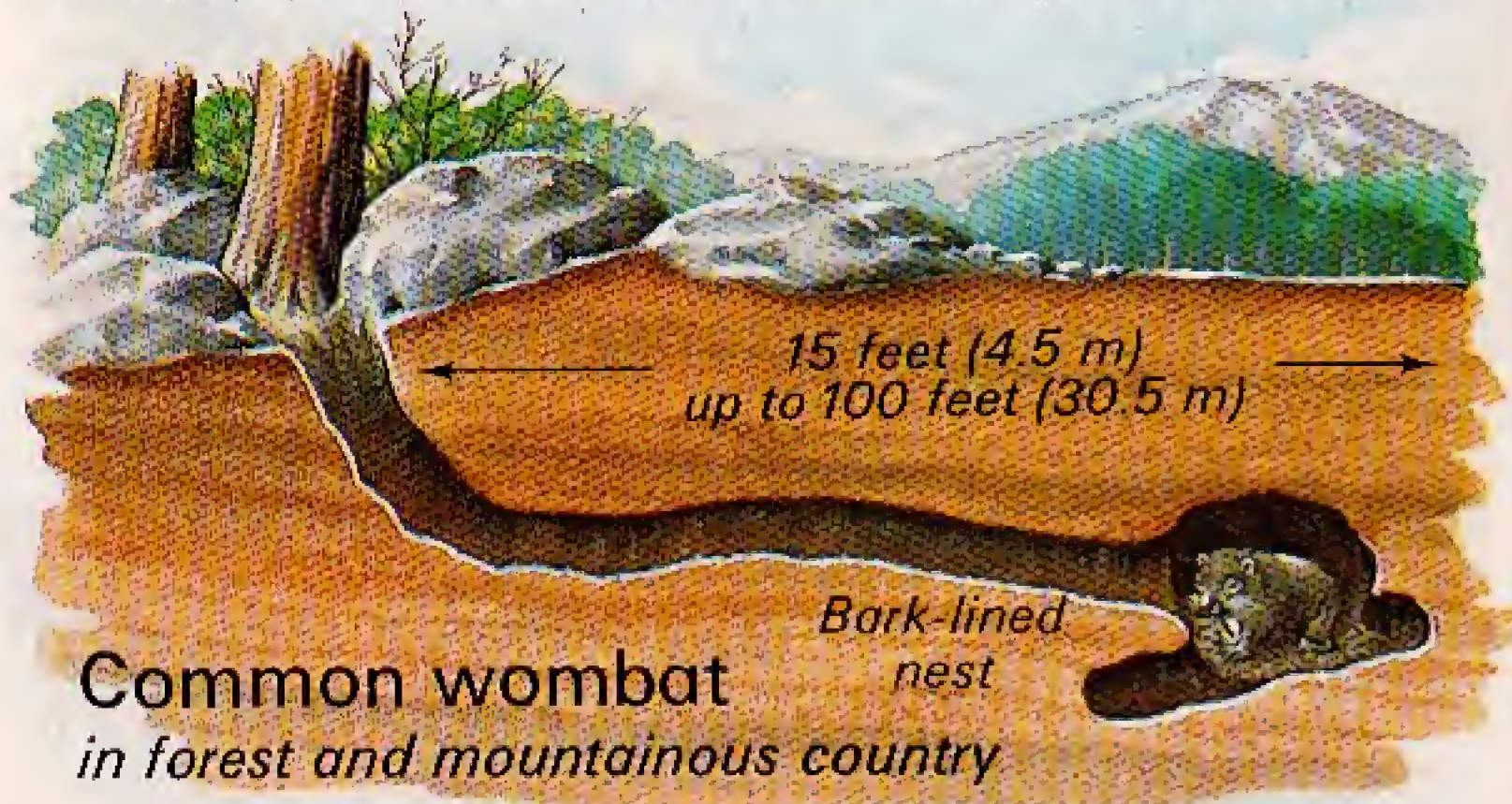


Badger sett



Fox lair
in modified badger sett

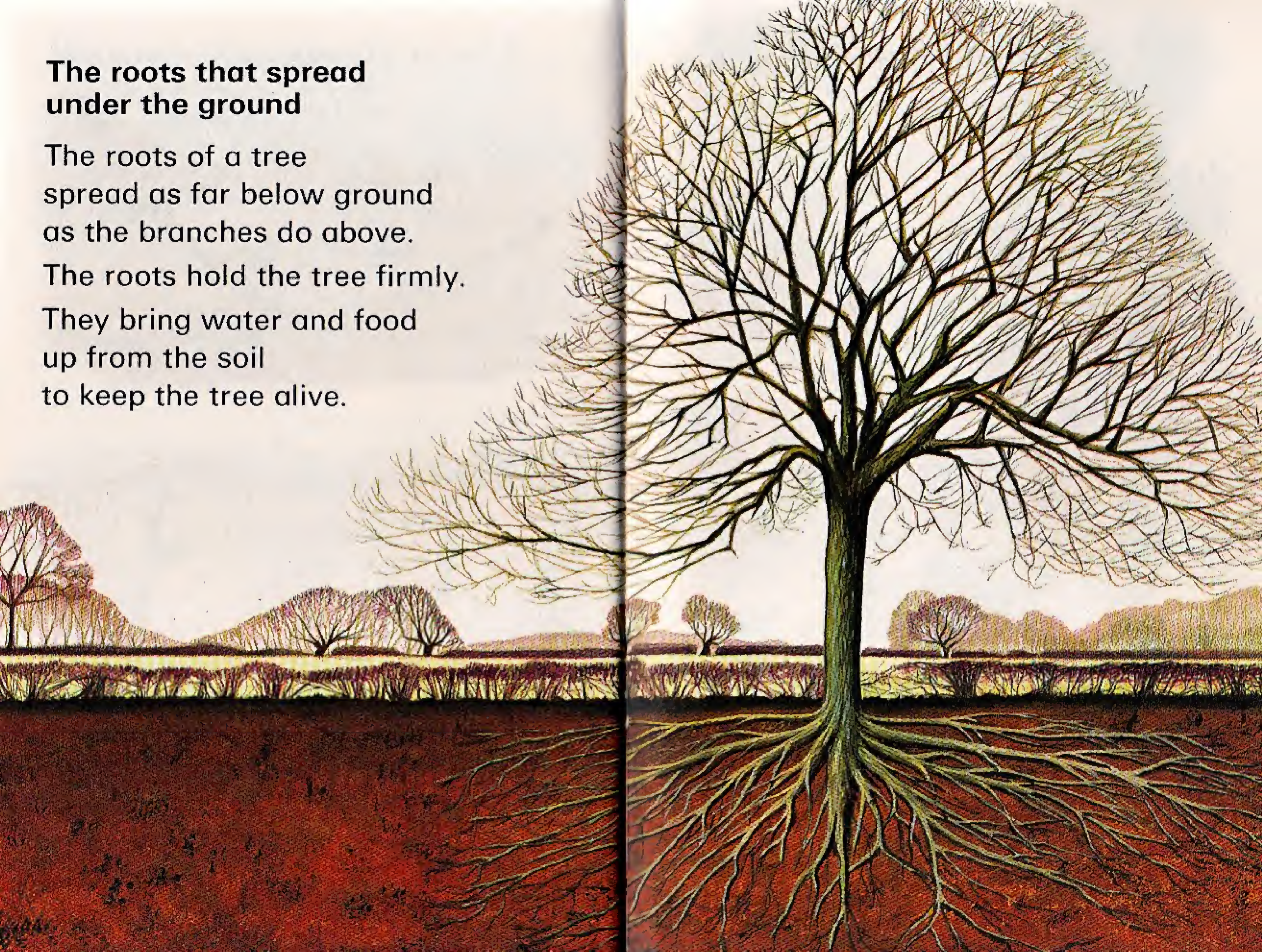
More animals under the ground.



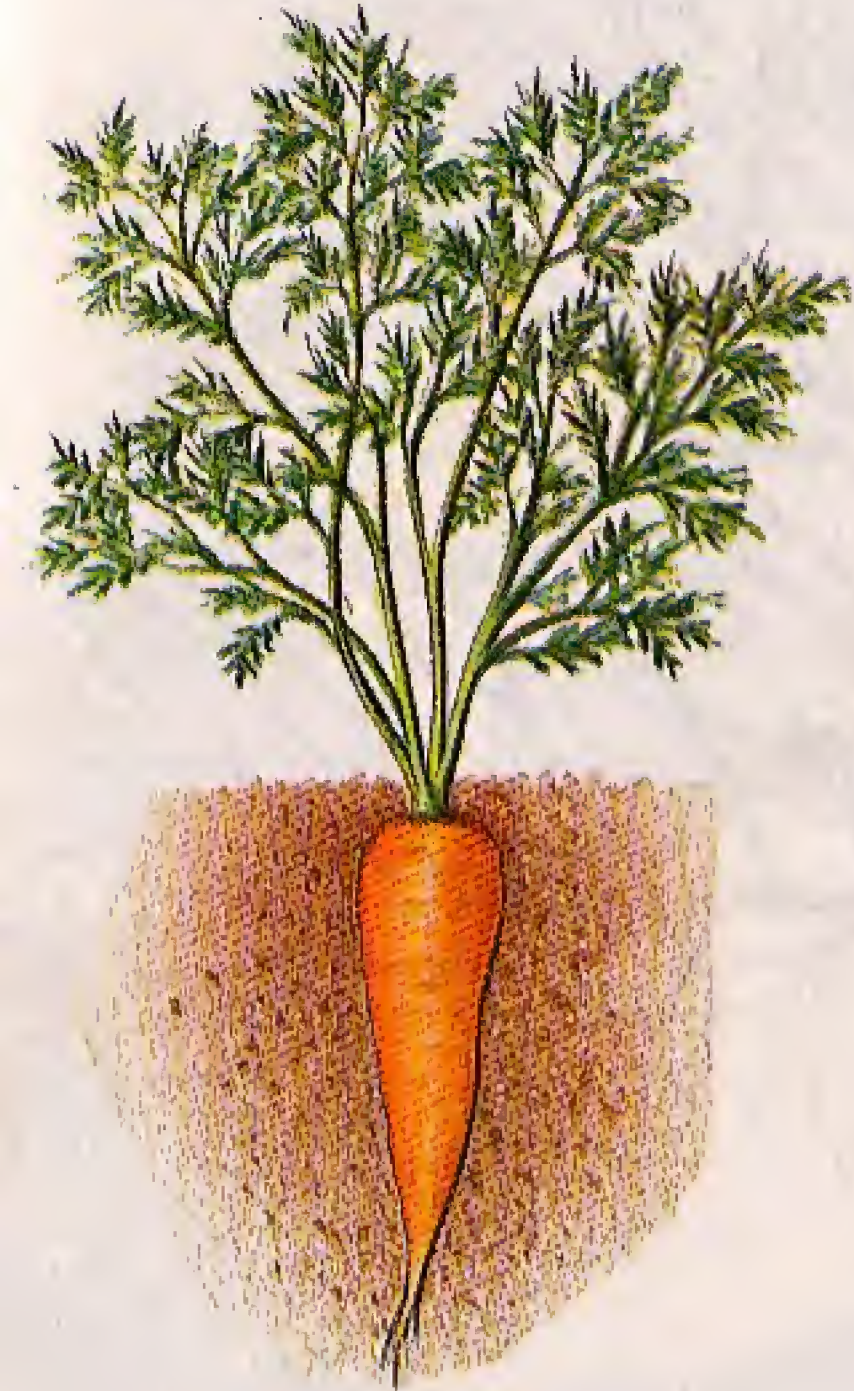
The roots that spread under the ground

The roots of a tree
spread as far below ground
as the branches do above.

The roots hold the tree firmly.
They bring water and food
up from the soil
to keep the tree alive.



Food from under the ground

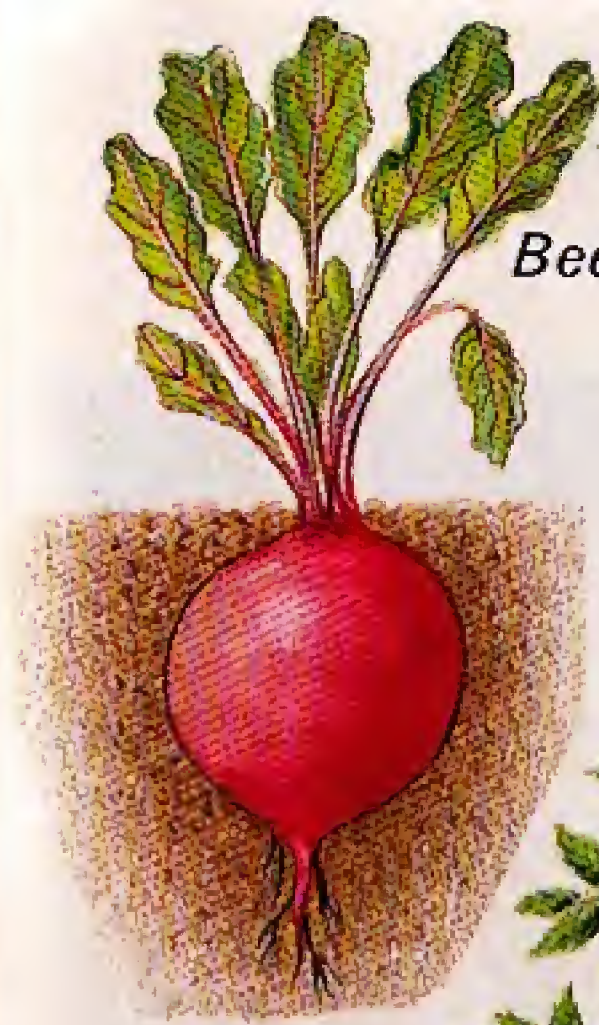


Carrot



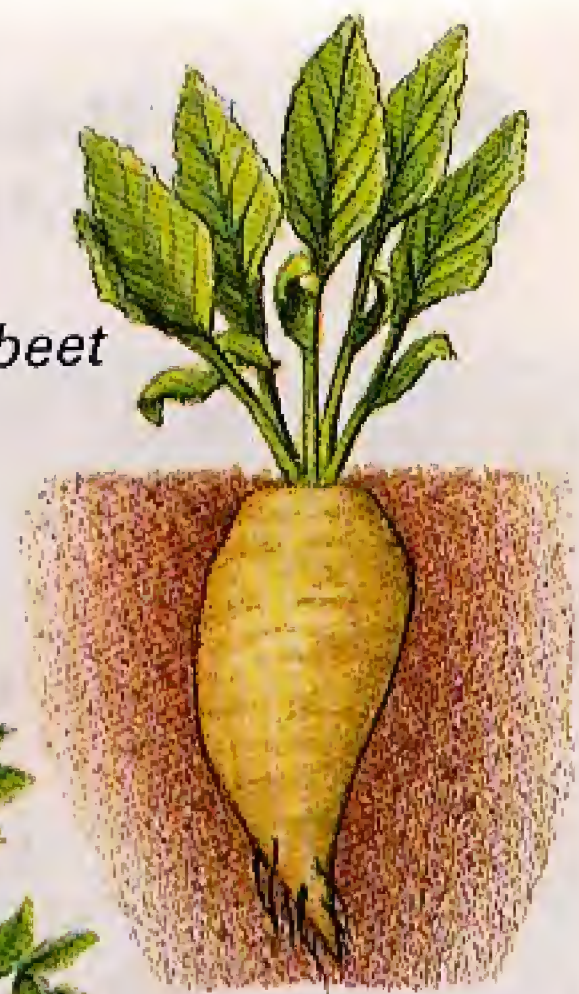
Radish

Some food has to be dug
from under the ground.
These are called root crops.

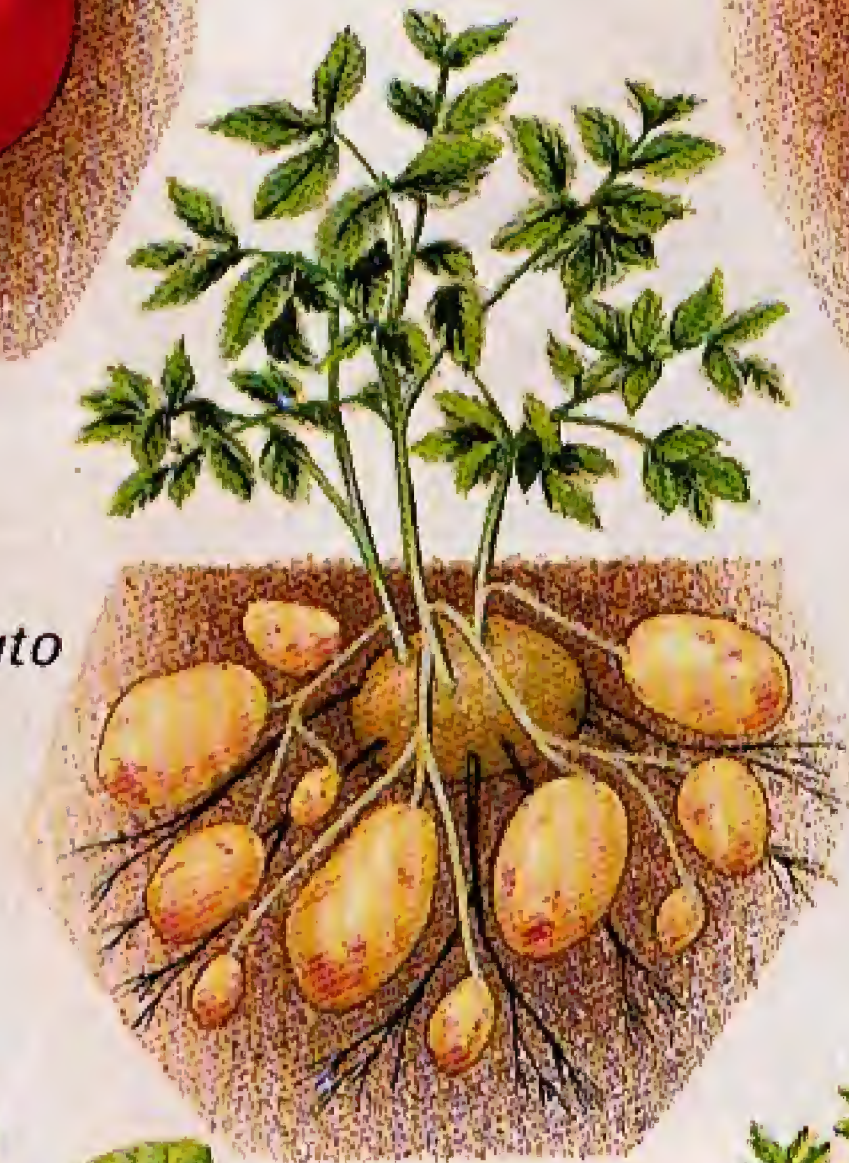


Beetroot

Sugar beet



Potato

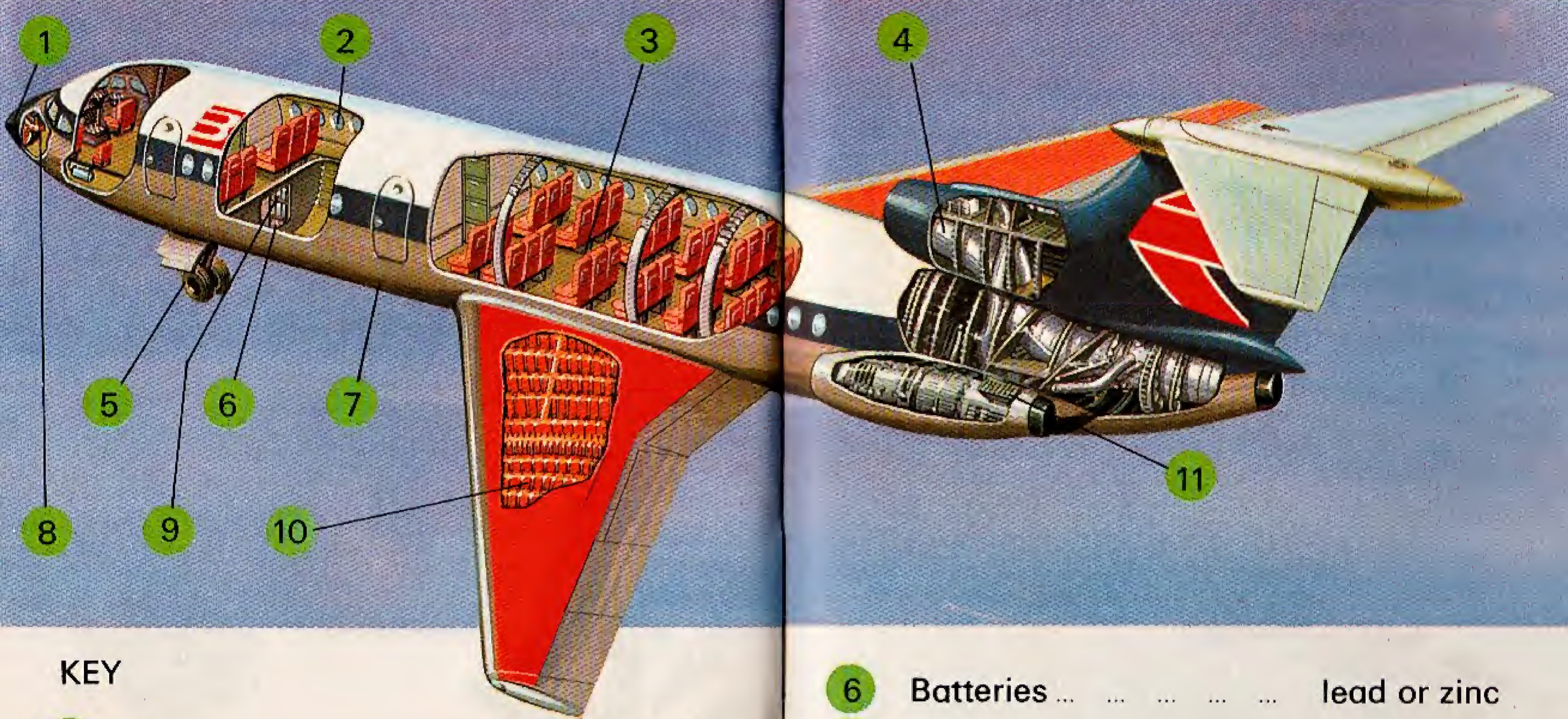


Turnip



Parsnip

Some of the minerals used in an aircraft



KEY

- 1 Nose plastic (from oil)
- 2 Windows glass (from silica)
- 3 Interior fittings plastic (from oil)
- 4 Engine intake... .. steel and chromium
- 5 Tyres rubber (with sulphur)

- 6 Batteries lead or zinc
- 7 Body aluminium
- 8 Search radar uses copper
- 9 Transistors use silicon
- 10 Fuel made from oil
- 11 Thrust reverser uses titanium

Cars, aircraft, ships,
factories and homes
use up huge amounts of oil
and other minerals.

Perhaps there are already
too many cars and aircraft.

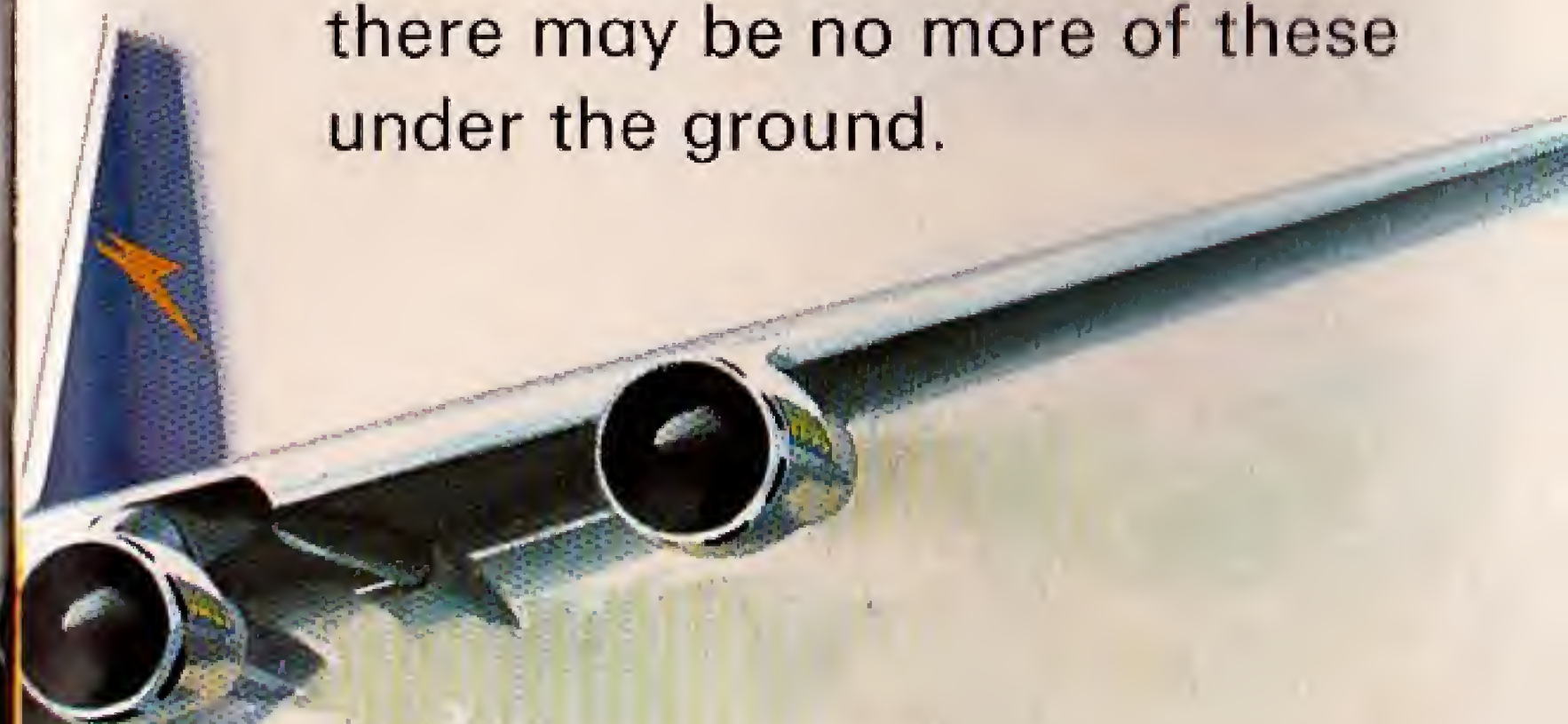
*This jumbo jet uses
12.2 tonnes an hour when cruising.
It carries 158.5 tonnes of fuel.*



Many people think we waste
too much oil.

Some of the minerals we need
are already scarce.

One day,
there may be no more of these
under the ground.



*This tanker carries
256,032 tonnes of oil*

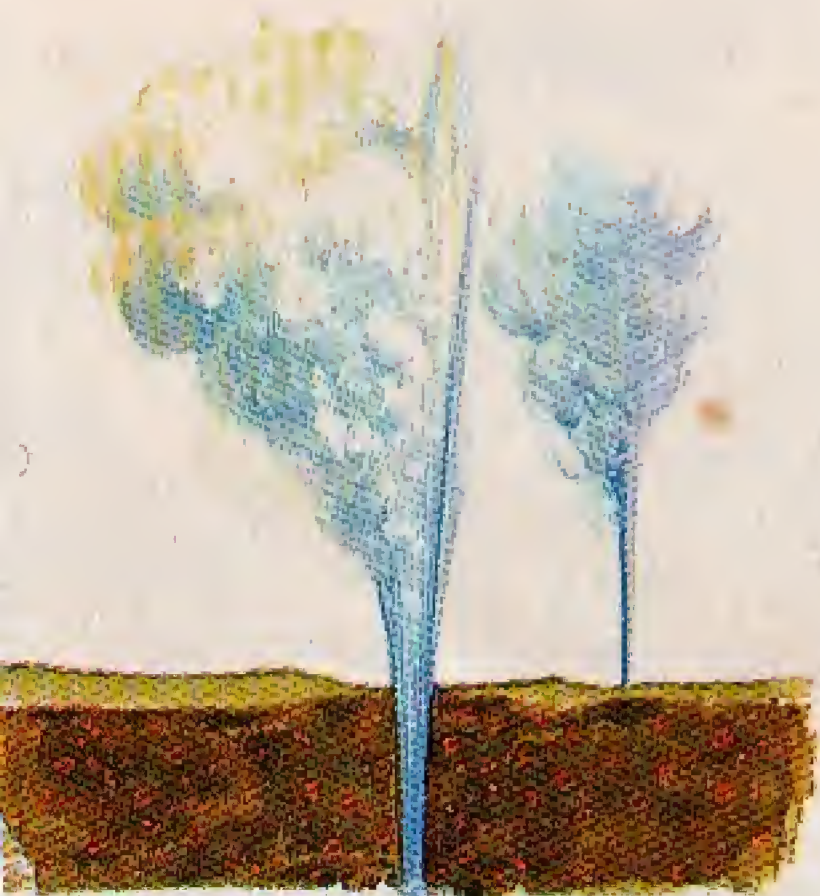




Flint



Fossil



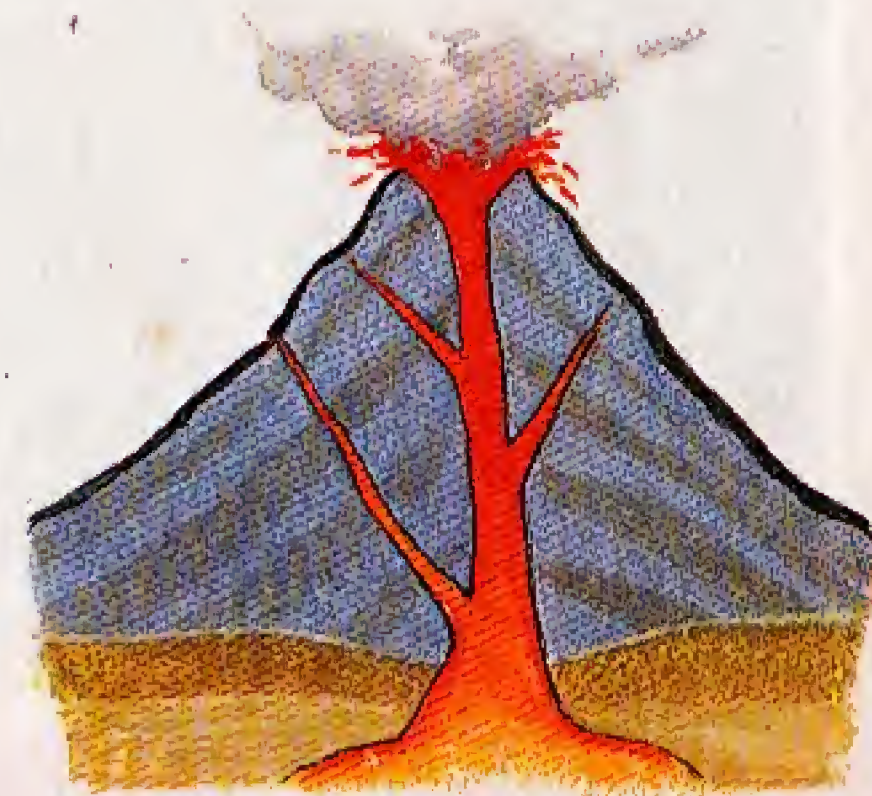
Geyser



Stalactites



Stalagmites



Volcano